



Report
on
Establishment
of

HARMONIZED PESTICIDE POISONING DATABASE IN INDIA



**Division of Medical Toxicology &
Risk Assessment**

Central Insecticides Laboratory

Directorate of Plant Protection, Quarantine & Storage
Ministry of Agriculture, Government of India

WITH THE SUPPORT OF

- World Health Organization Representative to India, New Delhi
- South-East Asia Regional Office (SEARO)
World Health Organization, New Delhi, INDIA
- International Programme on Chemical Safety (IPCS)
World Health Organization Headquarters, Geneva

Community Health Cell

Library and Documentation Unit

367, "Srinivasa Nilaya"

Jakkasandra 1st Main,

1st Block, Koramangala,

BANGALORE-560 034.

Phone : 5531518



Report
on
Establishment
of

HARMONIZED PESTICIDE POISONING DATABASE in INDIA



Division of Medical Toxicology & Risk Assessment

Central Insecticides Laboratory
Directorate of Plant Protection, Quarantine & Storage
Ministry of Agriculture,
Government of India

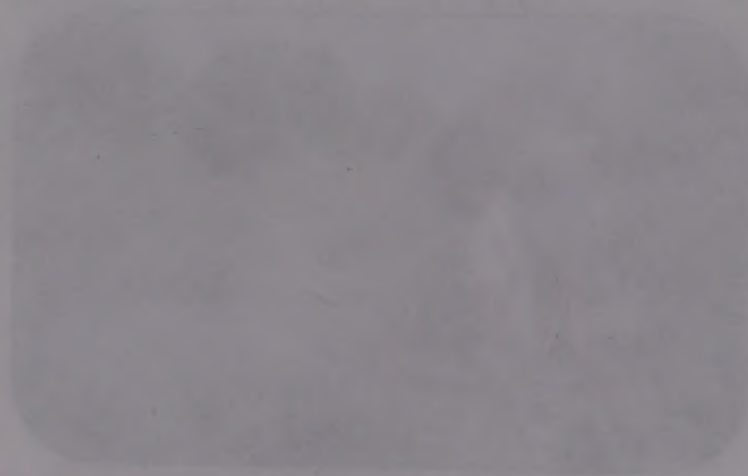
with the support of

- *World Health Organization Representative to India, New Delhi*
- *South-East Asia Regional Office (SEARO)
World Health Organization, New Delhi, INDIA*
- *International Programme on Chemical Safety (IPCS)
World Health Organization Headquarters, Geneva*



Report
on
Establishment
of

HARMONIZED PESTICIDE POISONING DATABASE in INDIA



Division of Medical Toxicology & Risk Assessment

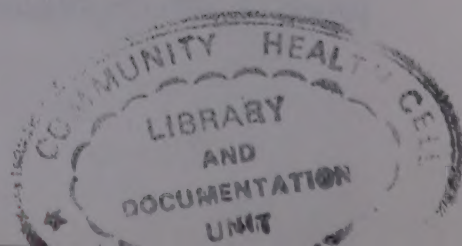
Central Poisoning Laboratory
Ministry of Agriculture
Government of India

With the support of

- World Health Organization (WHO)
- Department of Health and Family Welfare, Government of India
- Ministry of Agriculture, Government of India
- National Institute of Environmental Health Sciences (NIEHS), USA

G-150

07223

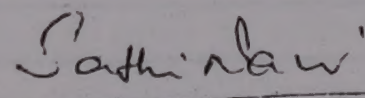


FOREWORD

Pesticides are the only chemicals which are extensively handled in agriculture by the general population, containing vectors of public health importance. Being toxic in nature, they pose hazards to the human population. Nevertheless, no database is existing either in India or globally to ascertain the extent of severity and damage. Pesticides Exposure Record (PER), a proforma devised by the World Health Organization (WHO) was put into action under a Government of India – World Health Organization Collaborative Project No. IND-PCS-001 from July, 1999 to June, 2000 for collecting pesticide poisoning data from 10 hospitals in States of Andhra Pradesh, Gujarat, Haryana, Karnataka and Punjab, the major pesticide consuming states. This data was collected, collated, analysed and reported by Dr. D. Kanungo, Head of Medical Toxicology Division, Central Insecticides Laboratory, Directorate of Plant Protection, Quarantine & Storage, Government of India under the Ministry of Agriculture with full technical support of the World Health Organization's Country Office in India.

1531 cases of poisoning reported from these 10 hospitals during the period of one year has given a baseline information regarding the extent of pesticide poisoning cases occurring in this country.

This data collection is the first one of its kind which was undertaken adopting the internationally accepted protocol. It is an excellent piece of work undertaken by the Division of Medical Toxicology, Central Insecticides Laboratory, Directorate of Plant Protection, Quarantine & Storage, Department of Agriculture & Cooperation, Ministry of Agriculture. However, more extensive study covering the entire country is the need of the hour to ascertain the correct national picture which will be helpful in taking policy decisions to contain pesticide exposure related illnesses.



(SATHI NAIR)

**Additional Secretary to Government of India
Ministry of Agriculture**

INDEX

1.	Executive Summary	1
2.	Introduction	2
3.	Objectives	4
4.	Agricultural Background of India	5
5.	Literature Survey regarding Pesticide Exposure in India	6
6.	Methodology for Data Collection	8
7.	Health Care System existing in India	9
8.	Data Collection Procedure	10
9.	Training of the Resource Persons	11
10.	Training of Medical Doctors	12
11.	Modalities of Operation	13
12.	Data Entry	13
13.	Analysis of the Data	13
14.	General Information collected from different centres	13
15.	Conclusions	14
16.	Recommendations	15
17.	Acknowledgement	16
18.	Bibliography	17
19.	Statement of Pesticide Poisoning Cases (Annexure I)	18
20.	Pesticide Exposure Record & Instructions (Annexure II)	19
21.	General Information Proforma (Annexure III)	24
22.	General Information – Bhatinda (Annexure IV)	25
23.	General Information – Gulbarga (Annexure V)	27
24.	General Information – Gulbarga (Annexure VI)	29
25.	General Information – Sirsa (Annexure VII)	30
26.	General Information – Warangal (Annexure VIII)	33
	Statistical Analysis	35
1.	Data Collection	36
1.1.	Type of Case	36
1.2.	Seasonal Trends in Pesticide Poisoning	37
1.2.1.	Seasonal Trends in Pesticide Poisoning vs Sex Distribution	38
1.3.	Main Activity vs Month	39
1.4.	Location vs Month	41
1.5.	Chemical Type of Product vs Month	43
1.6.	Number of Cases in Each State	46

2.	Communication	47
2.1.	Sources of Information	47
2.2.	Category of Persons supplying Information	47
3.	Patient Details	48
3.1.	Sex Distribution	48
3.2.	Age Distribution	49
3.2.1.	Age Group vs Sex Distribution	50
4.	Circumstances of Exposure	51
4.1.	Circumstances of Exposure vs Sex Distribution	51
4.2.	Circumstances of Exposure vs Age Group	52
5.	Main Activity at the Time of Exposure	53
5.1.	Main Activity at the Time of Exposure vs Sex Distribution	54
5.2.	Main Activity at the Time of Exposure vs Age Group	55
6.	Location of Exposure	56
7.	Route of Exposure	57
7.1.	Route of Exposure vs Sex Distribution	58
7.2.	Route of Exposure vs Age Groups	59
8.	Product Identity	60
8.1.	Physical Form of Product	60
8.1.1.	Physical Form of Product vs Age Group	61
8.2.	Actual Use of Product	62
8.2.1.	Actual Use of Product vs Age Groups	63
8.3.	Actual Use of Product vs Use Intended	64
8.4.	Registered Products involved in Poisoning	67
8.4.1.	Unregistered Products involved in Poisoning	69
8.5.	Number of Products Involved in Poisoning (Regd./Unregd./Not Mentioned)	70
9.	Chemical Type of Product	71
9.1.	Chemical Type of Product vs Sex Distribution	72
9.2.	Chemical Type of Product vs Age Group	73
10.	Number of Days in ICU/Hospital	74
11.	Type of Effects	81
11.1.	Severity (Poisoning Severity Score)	82
11.1.1	Severity vs Sex Distribution	83
11.1.2	Severity vs Age Groups	84
12.	Outcome	85
12.1.	Outcome vs Sex Distribution	86
12.2.	Outcome vs Age Group	87
13.	Comments	88
13.1.	Absconding	92

EXECUTIVE SUMMARY

Controversy exists regarding the extent and severity of the effect of pesticides on human health globally. Some pesticide poisoning data are reported from different parts of the country which, reveals the gravity of situation. To have a scientifically sound up to-date evidence, World Health Organization (WHO) has developed a Pesticide Exposure Record (PER) for collecting the information. The workshop organised by South East Asian Regional Office (SEARO) of WHO on "Pesticide poisoning database in SEAR countries" from 5-7 May, 1999 at New Delhi made action plan for collection of pesticide poisoning data adopting the PER in five countries of the South East Asia region i.e India, Indonesia, Nepal, Sri Lanka and Thailand. In India, Medical Toxicology Division, Central Insecticides Laboratory, Directorate of Plant Protection, Quarantine & Storage, Ministry of Agriculture, Government of India being the key agency for collecting and collating the information on pesticide poisoning was entrusted the work for this purpose. Dr. D. Kanungo, Head, Division of Medical Toxicology with the help of his staff collected the data from Ten hospitals in the States of Andhra Pradesh, Gujarat, Haryana, Karnataka and Punjab. The data thus collected adopting PER was from July, 1999 to June, 2000.

1531 cases of poisoning were reported from these 10 hospitals during this period of one year which were analyzed statistically. Maximum poisoning cases occurred in males only. September is the month during which maximum poisoning cases were reported by the different hospitals, which coincides with the pesticide spraying activities. Major cause of poisoning was intentional and the insecticide group responsible for this is organophosphorus followed by Fumigants (Aluminium phosphide).

More extensive study covering the entire country is need of the hour to ascertain the correct national picture.

INTRODUCTION

Pesticide poisoning is under-reported in all parts of the world, especially in the developing countries including India. Incomplete data suggests that a number of cases and deaths due to pesticide poisoning are higher than expected and have increased considerably with the introduction of organophosphorus and carbamate insecticides. Wherever there is an increase in the use of agricultural chemicals, human pesticide poisoning has become a major public health problem. Though some data is available on the occurrence of pesticide related poisoning among definite population particularly in developing world, no baseline description, epidemiological data on the extent of pesticide poisoning in India is available and hence is urgently needed. Poisoning by pesticides represents a public health problem in many other countries in the world especially in those with an agriculture-based economy like India. Global estimates prepared by World Health Organization in the past indicated that the problem was more severe mainly in the developing countries and that it requires urgent attention. However, controversy exists now-a-days about the actual extent and severity of the effect of pesticides on human health. Some of these statistical data reported and their associated conclusions are based on principles of limited comparability and should not be considered as representative of other countries and regions. Scientifically sound, up to date evidence on the magnitude of the problem is essential for planning the promotion of safe use of pesticides and reducing their adverse effects on health.

Interest in knowing more about the pesticide poisoning has been expressed by the medical sector, scientific associations, regulatory authorities, chemical industries and international organizations especially those dealing with health, food, work and aid programmes in different countries. In response to these, World Health Organization (WHO) has proposed a number of activities at the international level through consultation with the representatives of countries and organizations. A workshop was organised by South East Asia Regional Office (SEARO) of WHO on pesticide poisoning database from 5th-7th May, 1999 at New Delhi, in which India had played an active role in preparatory activities for harmonised data collection in the region, as a contribution to the international studies.

At the SEARO meeting, the mechanisms and strategies for the preparation of database were reviewed and a plan of action was agreed upon. Action Plan foresaw the participation of five countries in South East Asian Region:— India, Indonesia, Nepal, Sri Lanka and Thailand in this exercise. Accordingly, a project proposal concentrating on initial phase of original project was undertaken in a number of selected places including India during 1999-2000 period.

In India, Medical Toxicology Division, Central Insecticides Laboratory, Directorate of Plant Protection, Quarantine & Storage, Ministry of Agriculture, Government of India is the key agency for collecting and collating the information on pesticide poisoning. Dr. D. Kanungo, Head, Division of Medical Toxicology of the same organization had earlier participated in the Global WHO-IPCS Project and assisted in the development and testing of model harmonised

pesticide poisoning database. Since WHO Representative in India is conducting the above activity in collaboration with IPCS, Dr. D. Kanungo was considered to be the ideal person for field testing in selected areas in India during 1999. With the request of WHO Representative in India, Government of India permitted Dr. D. Kanungo to be the Nodal Coordinator for undertaking this work vide letter No. 18-9/99-PP.II, dated 30th August, 1999 and 29th September, 1999 of Ministry of Agriculture, Department of Agriculture and Cooperation, Government of India. The Coordinator was to define the study area within the country and health facilities where the data were to be collected. The methodology for data recording and central processing; the human resource training requirement for effective data recording, procedure for data analysis and dissemination of results at the country level would also be developed by him.

OBJECTIVES

The overall objective was to estimate the extent of human pesticide exposure and poisoning in selected regions with a view to implement prevention and education strategies to reduce the morbidity and mortality from pesticide poisoning. The main objectives were –

- (i) To prepare and maintain a database on pesticide poisoning cases with special reference to type of pesticide and circumstances of poisoning and the main population group affected.
- (ii) To identify the main products involved in human pesticide exposure and/or poisoning.
- (iii) To assess impact of human pesticide poisoning and exposure in relation to geographical/agricultural characteristics of the area covered by the study e.g., agriculture, forestry, animal husbandry.
- (iv) To publish and disseminate the results of the study.
- (v) To set the basis for planning, prevention and education activities in cooperation with other partners.
- (vi) To contribute to the regional and global components of the project.

AGRICULTURAL BACKGROUND OF INDIA

The Green Revolution that was introduced in 1950's led to a substantial increase in production of food grains mainly wheat and rice due to introduction of high yielding varieties of crops. This created regional and inter-province disparities as this plan was implemented only in selected areas with good irrigation facilities. Large inputs of fertilizers and pesticides were provided to the farmers to increase the yield. States like Punjab, Haryana, Western Uttar Pradesh, Andhra Pradesh marched ahead with the crop production. The annual crop production capacity has reached around 200 million tonnes. This could be possible only due to the use of seeds of high yielding varieties and other inputs. The high yielding variety of crops are more prone to attack by pests and diseases resulting in increased use of plant protection chemicals. The rapid rise in the use of pesticides led to poisoning and health hazards. This could have been prevented by decreasing the use of pesticides but taking into consideration the tremendous increase in population of India, which reached 1 billion in 2000, there is a need for increasing the food production as this population is about 16% of the world's population and housed in 2.4% of the world's land map. However, in order to prevent risk to human beings, animals and the environment, a comprehensive legislation called "The Insecticides Act, 1968" was enacted in India to regulate import, manufacture, sale, transport, distribution and use of insecticides.

LITERATURE SURVEY REGARDING PESTICIDE EXPOSURE IN INDIA

A number of reports/articles dealing with different aspects of pesticide exposure in India have been published. Most reports are from northern states of India namely Haryana, Punjab, Uttar Pradesh and Kashmir Valley.

Poisoning in children is a global problem. In a large majority of cases, it is the accidental poisoning which confronts the pediatrician, and is an important cause of mortality and morbidity. The retrospective data on childhood poisoning from eight regional hospitals in India has been reviewed by Dutta *et al.*, 1998. The analysis of data indicated that pediatric poisoning constituted 0.23 to 3.3% of the total poisoning. The mortality ranged from 0.64 to 11.6% with highest being from Shimla. Most of these poisoning were accidental. The highest rate of mortality recorded in Shimla was due to various plants and insecticides used in this region, where a large proportion of population depend upon horticulture and allied activities. Pesticide poisoning was also more prevalent in Punjab and West Bengal due to the same reason.

Another study on children carried out retrospectively for six years, representing 670 admissions to hospital in Kashmir Valley, presented pesticides as the second cause of poisoning (15%), after medicines and other chemicals (45%), kerosene and food poisoning were respectively in third and fifth position (Buch N.A., 1991).

Aluminium phosphide (AIP) is a solid fumigant pesticide for grain conservation. It was declared as an ideal pesticide because of it being cheap, most efficacious and easy to use. Aluminium phosphide poisoning has become a common cause to death among the younger generation in Northern India (Chugh S.N., 1992). In India, the first case of aluminium phosphide poisoning was reported in 1981. Its prevalence rate calculated on the basis of hospital admission was 2-3 cases per thousand admissions during 1986-87 and it surpassed every other poison in Haryana (Chugh S.N., 1992). This poisoning is most common in young adults, mostly in teens. The mode of poisoning is usually intentional, occasionally accidental and rarely homicidal. The agricultural community is more at risk due to illiteracy and easy availability of this pesticide in the household. The peak season for this is from May to September (Chugh S.N., 1992).

Endosulfan poisoning is gaining momentum and has become an important matter of concern for public health in India. Eighteen cases of endosulfan poisoning by accidental over exposure have been admitted between October, 1995 to September, 1997. Over exposure was due to failure to adhere to the instructions, ignorance or due to illiteracy (Chugh S.N. *et al.*, 1998). Nausea, vomiting, discomfort, tonic and clonic, convulsion and twitching were cardinal manifestations.

Paraquat, a dipyridium compound is widely used as a herbicide. It is available in India as a liquid concentrate for agricultural use and is highly toxic, when ingested. It leads to renal, hepatic, pulmonary toxicity, burns of oral mucosa and esophagus and of caustic nature.

Recently two cases of paraquat poisoning which developed serious toxicity following ingestion and died of respiratory failure were reported in Chandigarh (Singh S., *et al.*, 1999).

A study in the Kashmir Valley reported organophosphorus compounds as being most commonly ingested for suicide attempts in 74.4% of the patients (Malik G.M., *et al.*, 1998). Two third of the cases lived in districts with large areas of apple orchards.

A profile of acute poisoning in Haryana was established and published in 1994 (Siwach S.B. and Gupta A., 1995). The period of data collection was 14 months and 559 cases were gathered for analysis. 91.4% were self-inflicted poisonings, 8.1% were accidental and 0.5% were homicidal. The mean age was 27 years, male to female ratio was 2:1. Aluminium phosphide was the commonest substance involved (67.8%), followed by organophosphates and zinc phosphide (13.9% and 4.3% respectively). The overall mortality rate was 33.8%, but the mortality rate associated with Aluminium phosphide poisoning was as high as 67.6%.

Occupational hazards due to pesticides are under reported for many reasons. In order to ascertain its severity a study was conducted by the Medical Toxicology Division of Central Insecticides Laboratory, Ministry of Agriculture, Government of India from July, 1996 to February, 1997. During the study, the information on 702 cases was collected from the selected hospitals/centres of four states of Andhra Pradesh, Haryana, Punjab, Rajasthan and Union Territory of Pondicherry. Sources of information were secondary and tertiary health centres where doctors collected the data. For this purpose a draft format provided by International Programme on Chemical Safety (IPCS) of WHO was used. The sum and substance of the study is as under:

Maximum poisoning occurred in August to November with highest being in the month of October

Poisoning in adults	–	77.4%
Poisoning in male	–	67%
Intentional poisoning	–	72%
Accidental poisoning	–	12%
Suicidal rate	– Male	– 47%
	– Female	– 23.2%
Organophosphorus & aluminium phosphide	–	29% (each)
Oral route of administration	–	73%
Hospitalization in	– Male	– 25.9%
	– Female	– 14.9%
Death	– Male	– 15.5%
	– Female	– 5.9%

Under the Insecticide Act, 1968, there is a statutory provision to notify all occurrences of pesticide poisoning as per the information furnished by the States/UTs during last three years is at Annexure-I.

METHODOLOGY FOR DATA COLLECTION

To fulfil the specific objectives, data was collected using data collection format Pesticide Exposure Record (PER) devised by International Programme on Chemical Safety (IPCS), WHO and system agreed upon internationally (filled up proforma Annexure-II).

SELECTION OF HOSPITALS FOR COLLECTION OF DATA

India being a vast country, it is not feasible to collect the data from all over the country. On the basis of the experience, it is seen that the major portion of the pesticides are used for cotton crop followed by rice and vegetables. On the basis of the cropping pattern of the place, the following hospitals were selected for collection of data.

1. B.K. Hospital, Faridabad, Haryana
2. Escorts Hospital & Research Centre, Faridabad, Haryana
3. Government Hospital, Sirsa, Haryana
4. Pt. B.D. Sharma Medical College Hospital, Rohtak, Haryana
5. Civil Hospital, Bhatinda, Punjab
6. Guru Gobind Singh Medical College Hospital, Faridkot, Punjab
7. Mahadev Rampure Medical College Hospital, Gulbarga, Karnataka
8. Basaveshwar Teaching & General Hospital, Gulbarga, Karnataka
9. Kakatiya Medical College Hospital, Warangal, Andhra Pradesh
10. Poison Control Centre, National Institute of Occupational Health, Ahmedabad, Gujarat



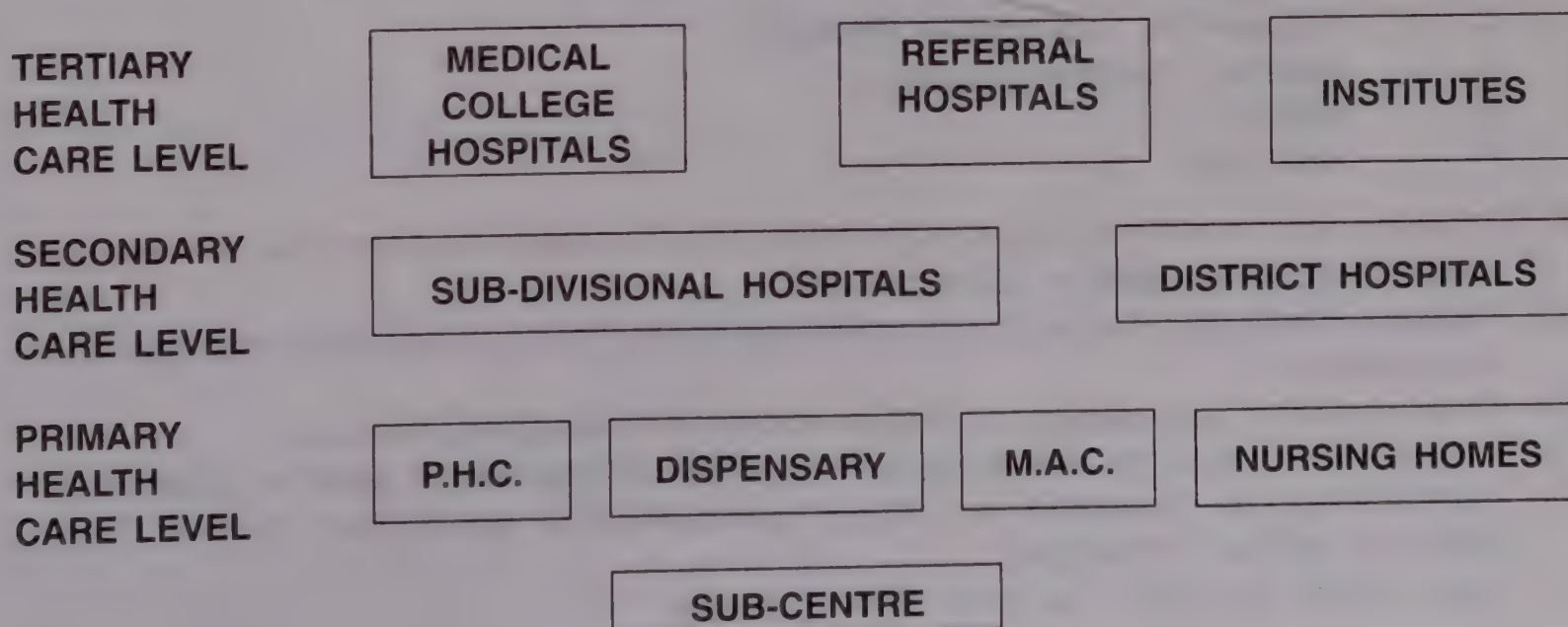
HEALTH CARE SYSTEM EXISTING IN INDIA

Efficacy of data collection depends on health care system of a country. In India the health care system is divided into three levels namely (a) Primary Health Care system; (b) Secondary Health Care system; and (c) Tertiary Health Care system.

- (a) **Primary Health Care system:** Primary health care system includes starting from village level sub-centres to Primary Health Centres. The types of medical centres which are considered to be the Primary Health Care Level are as under: (1) Sub-Centres; (2) Dispensaries; (3) Medical Aid Centres; (4) Primary Health Centres; (5) Rural Health Centres (6) Private practitioners at grassroot level. This is the level mostly when a person gets poisoned due to pesticides either during transport, storage, distribution or handling attends.
- (b) **Secondary Health Care system:** Secondary Health care system includes Sub-Divisional Hospitals, Taluk Hospitals, District headquarter Hospitals, private nursing homes etc. Either poisoned patients directly attend this level for diagnosis and treatment or are referred from Primary Health Care level.
- (c) **Tertiary Health Care system:** This level includes medical college hospitals, referral hospitals having sophistication and novelty and persons suffering from pesticide poisoning reaches this place when referred. However, where the pesticide treated crop area are nearer to this group of hospital, the patients also come directly to get attended.

The focus has to be given on these medical centres enumerated above for data collection on pesticide poisoning. Since pesticides are handled by farmers in rural areas our major focus should be on either primary health care level units or secondary health care level units. In smaller countries, it is possible to collect the pesticide poisoning data from the institutes at Primary and Secondary level without any problem. Nevertheless, in case of bigger country like India, it may not be possible and feasible to attempt such an epidemiological study. Hence, it is desirable to earmark those areas with large consumption of pesticides for data collection as the number of pesticide poisoning cases are mostly directly proportionate to the pesticides consumed in a particular area.

Health Care Pattern



DATA COLLECTION PROCEDURE

Pre-study survey to identify the area and hospital before starting the actual data collection was carried out to obtain information on the...

- (a) **Pattern of pesticide consumption in different areas – cropwise, pesticidewise:** This information was collected from different State Departments of Agriculture. It was found that the major share of pesticides are utilized for cotton crop, rice and vegetables. Andhra Pradesh, Punjab and Maharashtra consuming 50% of the market share of pesticides.

INDIAN PESTICIDES MARKET - BY STATE

S.No.	State	Market Share %
1.	Andhra Pradesh	24
2.	Punjab	15
3.	Maharashtra	11
4.	Karnataka	8
5.	Rajasthan	7
6.	Tamil Nadu	6
7.	Haryana	5
8.	Gujarat	5
9.	West Bengal	5
10.	Others	14
Total		100

Source: *Asian Crop Protection Markets Conference, 1997, Bangkok, Centre for Management Technology.*

On the basis of this information, identification of health care institutions was done in the areas mentioned above. The health care institutions and the doctors responsible for it were identified keeping in view the following criteria

- A – Acceptability, Accessibility, Aptitude, Agricultural activity
- B – Background
- C – Cooperation, Consumption (Pesticide)
- D – Devotion, Diagnosis Capability
- E – Efficiency
- F – Feed back

To summarise, while selecting the places, the following parameters were taken into consideration:

- (i) Easy and quick accessibility to the places;
- (ii) The area should be in the vicinity of agricultural activity having comparatively more pesticide consumption;
- (iii) There should be acceptability by medical doctors for undertaking this work;
- (iv) Doctors should have the background and capability of diagnosis of pesticide poisoning;
- (v) Doctors should be cooperative and should have aptitude for helping such a cause. Doctors should be devoted and efficient.
- (vi) There should be regular feed back of the operation.

TRAINING OF THE RESOURCE PERSONS

For data collection, training of all resource persons was undertaken in order to establish effective link between the Coordinator and peripheral health care institute for imparting training and extending assistance to the medical and paramedical staff entrusted with the responsibility of filling up of the proforma. There shall also be linkage between the Coordinator and peripheral health care institutions personally for collection and collation of proforma i.e. Pesticide Exposure Record (PER) and helping them in filling the forms from time to time. Hence, the training was organised on 05.11.1999 in which 8 resource persons were trained on the following points:-

- (1) Registration system of pesticides in the country;
- (2) Different groups of pesticides and their toxico-kinetics in the human body;
- (3) Symptoms of pesticide poisoning as per their groups starting from pesticide related illness till severe acute poisoning;
- (4) Simple laboratory aids for confirmation of diagnosis;
- (5) Management of pesticide poisoning including first aid measures, specific treatment with antidotes and supportive treatment;
- (6) Pesticides along with their trade names registered and used in the country;
- (7) Availability of labels and leaflet on the containers of pesticides
- (8) Modalities of filling up of proforma (PER)
- (9) Period of data collection.

TRAINING OF MEDICAL DOCTORS ON DIAGNOSIS AND MANAGEMENT OF PESTICIDE POISONING AND FILLING UP OF PROFORMA FOR COLLECTION OF DATA

Under the comprehensive legislation, 'The Insecticides Act, 1968', all pesticides are registered by the Ministry of Agriculture. During registration, the importer/manufacture provide all the relevant data including the chemical composition, biological properties, toxico-kinetics etc., on the basis of which the pesticides are evaluated regarding their safety and efficacy before registration. Once registered, these are distributed through out the country through commercial channel with different brand names and different formulations by the manufacturers/importers. The general medical doctors do not come across the technical aspect of the pesticides including the toxico-kinetics, mode of action, presenting symptoms in case of poisoning. This factor most of the time comes as a hindrance for the doctors for accurate diagnosis. For undertaking the epidemiological study, the doctors have to fill up the Pesticide Exposure Record (PER). The correct filling of the PER is only possible if the diagnosis of pesticide poisoning is accurate leading to proper management and treatment. Keeping in view this gap in the system, a series of on-site training programmes in the earmarked hospitals were undertaken with the help of resource persons already trained. During the training following points were given emphasis:-

1. Definition of pesticides, different groups of pesticides and their toxico-kinetics in the human body;
2. Registration system of the pesticides in the country;
3. Symptoms of pesticide poisoning;
4. Simple laboratory aids for confirmation of diagnosis;
5. Management of pesticide poisoning including first aid measures, specific treatment with antidotes and supportive treatment;
6. Pesticides registered and used in that particular area of the country along with their trade names;
7. Availability of labels and leaflet on the containers of pesticides.

The above information helped the medical doctors/paramedical staff to equip themselves to diagnose the pesticide poisoning cases. During the training some mock exercises were also undertaken to build up confidence among the doctors.

Preparation of literature for helping the medical doctors prior to the training

Literatures such as "Handbook on Management of Pesticide Poisoning, Diagnosis and Management of Pesticide Poisoning", "List of pesticides and their formulations", copies of PER etc. were prepared and distributed in different centres enabling them to undertake effective work.

MODALITIES OF OPERATION

1. Periodic Collection of Data

The medical and paramedical staff responsible for undertaking such activities were requested to fill up the format as and when they come across a pesticide poisoning patient and keep them ready with them. The resource persons with the Coordinator used to visit these places once in a month for collecting the proformae.

2. Meeting of The Staff

Coordinator as well as the staff working with him were periodically meeting medical doctors either individually or in groups to solve the identified problems. Their problems were being solved on-site and whenever needed, interim training programmes were organised.

3. Cross Checking

While collecting the PER, cross checkings were also being organised at random from the available record.

DATA ENTRY

With appropriate secretarial assistance all the data collected were entered to the computerised software system. The data entry has been doubly checked to help a good follow up and missing data.

ANALYSIS OF THE DATA

With the help of the statistician, the data was analysed.

GENERAL INFORMATION COLLECTED FROM DIFFERENT CENTRES

The general information as per the questionnaire at Annexure- III were requested from the Centres. However, five centres have provided this information which may be seen as Annexures IV-VIII.

CONCLUSIONS

1531 cases of poisoning were reported from 10 hospitals of India for a period of one year (July 1999 to June, 2000). Maximum poisonings occurred in males (64.53%). Most of the cases occurred in the adult age group (73.09%) followed by adolescents (16.53%) and children (2.35%) respectively. The major cause of poisoning was intentional (85.17%) followed by occupational (5.42%) and accidental (4.70%). Insecticides were the major culprit (54.41%) followed by fumigants (24.82%). More than half of the pesticides involved in poisoning were liquids (51.01%) while 38.93% were solids. Organophosphates (39.78%), phosphides (27.82%) and carbamates (6.92%) were the groups involved in most cases. 47.22% poisoning occurred in rural houses while 40.63% in urban/periurban houses and only 8.10% occurred in farm/fields. 91.05% of the poisoning occurred through oral route, only 3.53% occurred through respiratory route and 3.79% through combined route. Majority (60.09%) of the cases presented with systemic poisoning followed by local as well as systemic involvement in 21.49% of the cases while 10.91% had only local signs & symptoms. Mild, moderate and severe cases of poisoning occurred in 26.19%, 32.92% and 29.98% of the cases respectively.

52.65% of the poisoning were caused by the pesticides approved for use in the country while 3.98% of the poisonings due to the pesticides not approved for use in the country. The product identity as regard registration status was not known in 43.37% of the cases.

It has been observed in this study that the reporting as per the PER has not been appropriate.

RECOMMENDATIONS

1. Filling of PERs needs improvement. More training and interaction is needed with medical and paramedical staff responsible for reporting cases of poisoning.
2. The present study covers only 10 hospitals from 8 districts of India and was carried out only for one year. India has 546 districts in total. The study should be wider involving all the districts and should be undertaken for at least one year preferably for three years.
3. More emphasis should be laid on general awareness on safe and judicious use of pesticides especially with reference to safe storage at homes, as maximum poisonings occurred in homes.
4. Doctors and medical staff should be made aware of the signs and symptoms and management of pesticide poisoning.
5. Availability of antidotes and other supportive medicines should be ensured at the hospitals.
6. Some mechanism should be evolved to check the use of pesticides which are not approved for use in the country.
7. Beside taking measures to ensure the safe & judicious use of pesticides the circumstances of poisoning being intentional in most cases, the psychosocial counselling becomes an important aspect of overall management of the problem.

ACKNOWLEDGEMENT

The Ministry of Agriculture acknowledges the contribution of SEARO-WHO, WHO Representative in India and International Programme on Chemical Safety (IPCS)-WHO for their funding this project. The support and concurrence of Ministry of Health and Family Welfare and Ministry of Agriculture for this project is acknowledged. The Coordinator is grateful for the guidance of Smt. Sathi Nair, Additional Secretary; Sh. P.D. Sudhakar, Joint Secretary; Sh. Joginder Singh, Director (PP), Department of Agriculture & Cooperation; Dr. R.L. Rajak, Plant Protection Adviser to the Government of India; Dr. V. Ragunathan, Director, Central Insecticides Laboratory and help extended by other supporting staff of Department of Agriculture & Cooperation and Directorate of Plant Protection, Quarantine & Storage for accomplishing the job. The cooperation extended by the staff of the Medical Toxicology Division of Central Insecticides Laboratory in general and Sarbasri J.C. Mallick, K.C. Diwan, Satish Kumar and M.T. Sambadam in particular as well as Accounts and Administration staff of this Directorate for their wholehearted support is acknowledged.

The stenographic assistant extended by Sri R.Venkateshan is remarkable and highly acknowledged.

The Coordinator is grateful to the following doctors, their colleagues and supporting staff who took active interest through out the year in collection and collation of the data.

1. Dr. Aruna Dewan, Deputy Director & Incharge, Poison Information Centre, National Institute of Occupational Health, Ahmedabad (Gujarat)
2. Dr. Ashok, Escorts Hospital & Research Centre, Faridabad (Haryana)
3. Dr. C. Paul, Badshah Khan Hospital, Faridabad (Haryana)
4. Dr. Jagdish Chaudhry, Medical Officer, Civil Hospital, Sirsa (Haryana)
5. Dr. M.R. Gupta, Civil Hospital, Bhatinda (Punjab)
6. Dr. P. Jagdish Prasad, Professor & Head, Department of Pharmacology, Kakatiya Medical College, Warangal (Andhra Pradesh)
7. Dr. Pankaj Dhar, Escorts Hospital & Research Centre, Faridabad (Haryana)
8. Prof. S.B. Siwach, Director Principal, Pandit B.D. Sharma Medical College & Hospital, Rohtak (Haryana)
9. Dr. S.K. Puri, Badshah Khan Hospital, Faridabad (Haryana).
10. Shri S.S. Hiremath, Associate Professor, Mahadevappa Rampure Medical College & Hospital, Gulbarga (Karnataka)
11. Dr. T.L. Parmar, Dean, Guru Gobind Singh Medical College & Hospital, Faridkot (Punjab)

12. Dr. T.M. Chandrasekhar, Dean, Mahadevappa Rampure Medical College & Hospital, Gulbarga (Karnataka)

BIBLIOGRAPHY

1. Chugh S.N., Dhawan, R., Agrawal, N., Mahajan, S.K. – Endosulfan poisoning in Northern India: A report of 18 cases. *Int. J Clin Pharmacol Ther.*, 1998; **36**(9): 474-7
2. Chugh S.N., Aluminium phosphide poisoning: Present status and management *JAPI*, 1992; **40**(6): 401-5.
3. Dutta *et al.*, Poisoning in Children: Indian Scenario. *Indian J Pediatrics*, 1998; **65**: 365-370.
4. Singh, S., Bambery, P., Chaudhry, D., Makharia G., Kakkar, N., Singh, D., Fatal Paraquat poisoning a report of 2 cases. *JAPI*, 1999, **47**(8): 831-832.
5. Siwach, S.B. and Gupta, A., The Profile of acute poisoning in Haryana – Rohtak study, *JAPI*, 1995; **43**(11): 756-759.
6. Buch, N.A., Ahmed, K., Sethi, A.S., Poisoning in Children, *Indian Pediatr.*, 1991, **28**(5): 521-4.
7. Malik G.M., Mubarik, M., Romshoo, G.J., Organophosphorus poisoning in Kashmir Valley, *N Eng J Med*, 1998, **338**(15): 1078.

**STATEMENT SHOWING THE NUMBER OF
PESTICIDE POISONING CASES (STATEWISE)
DURING LAST THREE YEARS**

S.No.	Name of States/UTs	1996-97	1997-98	1998-99
1.	Andaman & Nicobar	Nil	Nil	Nil
2.	Andhra Pradesh	13	Nil	76
3.	Arunachal Pradesh	N.R	Nil	Nil
4.	Assam	Nil	Nil	Nil
5.	Bihar	N.R	Nil	Nil
6.	Chandigarh	Nil	Nil	N.R
7.	Dadra & Nagar Haveli	N.R	N.R	N.R
8.	Daman & Diu	N.R	N.R	N.R
9.	Delhi	N.R	N.R	N.R
10.	Goa	Nil	Nil	Nil
11.	Gujarat	2	Nil	Nil
12.	Haryana	302	151	125
13.	Himachal Pradesh	N.R	N.R	55
14.	Jammu & Kashmir	N.R	Nil	Nil
15.	Karnataka	Nil	5	Nil
16.	Kerala	803	834	648
17.	Lakshadweep	N.R	N.R	N.R
18.	Madhya Pradesh	Nil	Nil	Nil
19.	Maharashtra	815	2751	3358
20.	Manipur	Nil	Nil	Nil
21.	Meghalaya	Nil	Nil	Nil
22.	Mizoram	Nil	Nil	Nil
23.	Nagaland	Nil	Nil	Nil
24.	Orissa	Nil	Nil	Nil
25.	Pondicherry	549	415	291
26.	Punjab	180	252	586
27.	Rajasthan	418	420	421
28.	Sikkim	Nil	Nil	N.R
29.	Tamil Nadu	379	73	143
30.	Tripura	Nil	Nil	Nil
31.	Uttar Pradesh	Nil	42	Nil
32.	West Bengal	N.R	N.R	N.R

Remarks: The figures have been compiled based on the information furnished by the States/UTs either at the Zonal Conferences or figures furnished to Govt. of India, Ministry of Agriculture, Department of Agriculture & Cooperation, Directorate of Plant Protection, Quarantine & Storage, Faridabad.

“N.R” – Not Reported.

PESTICIDE EXPOSURE RECORD (Confidential)

1. EXPOSURE TIME AND PLACE		(R)	Record No.:	09106010001
Date of Consultation:	05/08/99	Time elapsed since Exp:	12 hs	City:
Date of Exposure:	04/08/99	Duration:		Province:
Gujarat				

2. COMMUNICATION (Source of information)			
Name: Resident	Institution: Civil Hospital	(G)	Phone:
Category of person supplying information			Data Collection Date:
<input checked="" type="checkbox"/> Medical <input type="checkbox"/> Paramedical			Officer's Initial

3. PATIENT DETAILS			
Name (Initials)		KMS	
Sex		Identity N°	
<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	Age:	25 yr	<input type="checkbox"/> Unknown If unknown: <input type="checkbox"/> Child <input type="checkbox"/> Adolescent <input checked="" type="checkbox"/> Adult

4. CIRCUMSTANCES OF EXPOSURE (check one, plus "uncertain", if relevant)				
<input checked="" type="checkbox"/> Intentional	<input type="checkbox"/> Accidental	<input type="checkbox"/> Occupational	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Unknown ()

5. MAIN ACTIVITY AT TIME OF EXPOSURE (check one, or more than one if "Multiple")		
<input type="checkbox"/> Manufacturing/Formulation <input type="checkbox"/> Application in Field <input type="checkbox"/> Public Health Campaign <input type="checkbox"/> Household Application <input type="checkbox"/> Field Re-entry	<input type="checkbox"/> By-Standing <input type="checkbox"/> Transportation <input type="checkbox"/> Mixing/Loading <input type="checkbox"/> Equipment Care <input type="checkbox"/> Human Therapy	<input type="checkbox"/> Veterinary Therapy <input type="checkbox"/> Multiple (Specify) _____ <input checked="" type="checkbox"/> Not Relevant <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Unknown

6. LOCATION OF EXPOSURE (check one)				
<input type="checkbox"/> Home (Urban/Periurban)	<input checked="" type="checkbox"/> Home (Rural)	<input type="checkbox"/> Farm/Field	<input type="checkbox"/> Greenhouse	<input type="checkbox"/> Unknown
<input type="checkbox"/> Garden (Urban/Periurban)	<input type="checkbox"/> Garden (Rural)	<input type="checkbox"/> Public Area	<input type="checkbox"/> Storage Site	<input type="checkbox"/> Other Specify _____

7. ROUTE OF EXPOSURE (check main route or more than one, if applicable)				
<input checked="" type="checkbox"/> Oral	<input type="checkbox"/> Dermal	<input type="checkbox"/> Respiratory	<input type="checkbox"/> Ocular	<input type="checkbox"/> Unknown <input type="checkbox"/> Other (Specify) _____

8. PRODUCT IDENTITY (add other page(s), if necessary, for fresh product)		
Product Name(s)	Phorate and Chlorpyrifos	<input type="checkbox"/> Unknown <input type="checkbox"/> Concentration (if available) _____
Physical form:	<input type="checkbox"/> Gas <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Solid <input type="checkbox"/> Unknown	(Co-ordinator to fill-in) Use intended: <input type="checkbox"/> Registered <input type="checkbox"/> Not Approved
Actual Use:	<input checked="" type="checkbox"/> Insecticide <input type="checkbox"/> Herbicide <input type="checkbox"/> Tick Control <input type="checkbox"/> Unknown <input type="checkbox"/> Rodenticide <input type="checkbox"/> Fungicide <input type="checkbox"/> Other (Specify) _____	

9. CHEMICAL TYPE (check one or more if relevant)				
<input checked="" type="checkbox"/> Organophosphorus	<input type="checkbox"/> Thiocarbamate	<input type="checkbox"/> Dinitrophenol Deriv.	<input type="checkbox"/> Fluoroacetate	<input type="checkbox"/> Unknown
<input type="checkbox"/> Carbamate	<input type="checkbox"/> Coumarin	<input type="checkbox"/> Organomercurial	<input type="checkbox"/> Other (Specify) _____	
<input type="checkbox"/> Organochlorine	<input type="checkbox"/> Diphyridyl	<input type="checkbox"/> Phosphide	<input type="checkbox"/> Specific Chemical _____	
<input type="checkbox"/> Pyrethroid	<input type="checkbox"/> Phenoxyacid	<input type="checkbox"/> Arsenical		

10. MANAGEMENT				
Treatment Given:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> Referef to other hospital		
Hospitalisation:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	If yes, days in hospital	15	Days in ICU
10				

11. SEVERITY GRADING				
Effects:	<input type="checkbox"/> Localised <input checked="" type="checkbox"/> Systemic <input type="checkbox"/> Both	PSS:	<input type="checkbox"/> None <input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Severe	

12. OUTCOME				
<input checked="" type="checkbox"/> Recovery	<input type="checkbox"/> Recovery with Sequelae	<input type="checkbox"/> Death Related	<input type="checkbox"/> Death Unrelated	<input type="checkbox"/> Unknown

13. COMMENTS (stating section, continue overlead if necessary)				

INSTRUCTIONS TO ENTER THE DATA ON PESTICIDE EXPOSURE RECORD INTO THE ACCESS FORMAT

When you receive the e-mail with the database, first, download it directly into your hard drive: click on the icon "PEST***.MDB" and go into the menu File/ Save attachment, and save the database in a relevant folder of your hard drive.

The data entry has to be done on the hard disk of the computer, never on the floppy disk. When you receive the floppy disk, install the database on the computer, or download the database from the electronic version as explained before.

The floppy disk will be used once you have completely finished the data entry. At that moment, you will put the database with all the records on the floppy (zip it if necessary) and send it via mail.

The name of the database is PEST***.mbd (the *** represent the abbreviation for your country). Once it is opened, the screen shows the elements of the database with a different label for each one.

The sheet titled "Forms" contains the format to be used by the person entering the data.

The sheet "Tables" contains a table that is going to store the record row by row. In each row, the data concerning one and only one patient is registered.

How to enter the data?

First, you need to open the form "Pesti***_form". The format is similar the Excel format sheet where the information has been written on. The main difference is the presence of some lists for the choice of the items, so that you can not see the whole choices possible unless you click on the arrow situated at the right side of the small boxes. The table "Pest***_table" is to store the information you entered in the form.

1. EXPOSURE TIME AND PLACE

Type of record: Click on the arrow at the right side of the box and choose one of the choices listed: Prospective or Retrospective. Then, with one tabulation, you can go to the next item.

Record number: You see four distinct boxes for this number.

- The first box indicate the code of the country in three digits, it appears automatically, **and you do not have to enter it or change it. Go with one tabulation directly to the next box:**
- The second box contains a format to enter two digits, concerning the Province number. Enter these two digits. For the number "1", it has to be coded as "01", the computer automatically insert the separation between the numbers.
- The third box is for the site number (District Hospital code), allocated by the co-ordinator. It is a two-digit box as well.
- **In the fourth box, you enter a four-digit number allocated to each case.**

Once, the record number is updated, it may be that all the "0" which are not significant numbers disappears, but it is a normal way for the computer to register the numbers, you do not have to try to change it.

Consultation date: click inside the box and a special format to enter the date will appear. For the day, two digits have to be entered (for example, 1st day of the month has to be coded 01). The same applies for the month and for the year. Example: 15th July 1999 is coded: 15/07/99.

Exposure date: Use the same way as for "Consultation date". If the person wrote N/A for not applicable, then leave a blank in this box.

Time since exposure: In the first box, you enter the number, with the number of digits needed, there is no restriction for it. The second box is to indicate the units of time. Click on the arrow the see the choices: Hour(s) / Day(s) / Month(s), and click on the relevant one.

Exposure duration: Refer to the instructions given for "Time since exposure".

Province: Enter the name of the Province where the data collection took place.

City: Enter the name of the city where the data collection took place.

2. COMMUNICATION (Source of information)

Name: Enter the name of the person who collected the information.

Category: Click on the arrow situated at the right side of the box, you have the choice between "Medical professional" or "Paramedical", click on the relevant one.

Institution: Enter the name of the institution where the information has been collected.

Type of Institution: report the statement into brackets (G) or (P), click on the arrow at the right side to view the choices "Governmental" or "Private" and click on the relevant one.

Phone: You can enter the phone number of the institution without any separation between the numbers.

Data collection date: Concerns the date when the information has been written down on the paper. Use the same way as for the "Consultation date".

Officer's initials: Enter the initials of the person who wrote that information on the paper.

3. PATIENT DETAILS

Name or initials: Enter the name or initials of the patient exposed to the pesticide.

Sex: With the arrow, you can see the list "Male" or "Female" and choose the relevant one.

Identity number: Type the identity number with as many digits as necessary.

Age: The first box is to enter the number and the second box contains a list where you have to click on the relevant unit for the age: "Days", "Months" or "Years". **If the age is unknown**, then leave a blank and **precise** which age category "Child", "Adolescent" or "Adult" is relevant for the patient.

4. CIRCUMSTANCES OF EXPOSURE

Choose the circumstances in the list by clicking on the right item. If the circumstances are not very sure, you can choose the item with the mention "... but uncertain" which is linked to the different possibilities in the list.

5. MAIN ACTIVITY AT TIME OF EXPOSURE

Choose in the list the main activity at time of exposure. By doing so, the box "If other, specify" will be filled so that it is not possible to write something in it.

If the possibility "Other" has been chosen by the person who filled the sheet, then, leave a blank in the list and type the answer in the box "If other, specify".

If the activities were more than one, then, precise the other choice(s) in the box "If multiple, specify other activity(ies)".

6. LOCATION OF EXPOSURE

Choose the location from the list, if ever the location was not present among the different possibilities, then leave a blank and use the box "If other, specify" to type the location.

When you make a choice in the list, it is not possible then to write something in the box "If other, specify".

7. ROUTE OF EXPOSURE

Check the route(s) of exposure. And if the relevant route is another one, then, specify it in the box at the right side. If it is unknown, then, type it.

8. PRODUCT IDENTITY

Product name: You have to type it. If ever it is unknown, then, use the label "If unknown, click here" and "Unknown" will appear in the box.

Physical form: Click on the arrow to view the possible choices and select the relevant one.

Concentration if available in %: enter the concentration if necessary, but do not type the sign "%" which is not necessary here.

Actual use: Choose the relevant choice from the list. The mention "choice already made in the list will appear in the box at the right side. If the actual use is not present in the list, then leave a blank and use the box "If other, specify" to type it.

Use intended: Enter the answer.

Registered: check the box if the product is registered.

Not approved: check the box if the product is not approved in the country (this box is independent from the box "registered").

Other product(s): if the patient was exposed to more than one product, then, check the box and

a sub-form will appear to let you enter the information concerning the second and third product if necessary.

Before you start entering the information concerning the second product, check that the record number at the bottom of the screen is the same as the record number on the main form (yellow one) on the computer.

At the end, close the sub-form (green one) to return in the main-form and go on. The information is automatically saved.

9. CHEMICAL TYPE

Click on the arrow to view the choices listed. If the substance was actually a mixture of pesticides, then specify the other chemical type(s) in the next box, do not take into account the mention "Choice from the list" in the box, just write over it. If the chemical type is not mentioned, type "Unknown".

Specific chemical: type the answer if necessary or leave a blank if the person who provided the information did not mention it.

10. CASE MANAGEMENT

Treatment given: the list contains the four choices present on the paper. Choose the relevant one.

Hospitalisation: Same as above.

If yes, total days in hospital: type the corresponding number if relevant.

Days in ICU: same as above.

11. SEVERITY GRADING

Effects: choose one of the three choices.

PSS: Choose one of the four choices.

12. OUTCOME

Choose one of the five choices.

13. COMMENTS

Type the statements that might have been written on the paper.

GENERAL INFORMATION

In order to allow a detailed analysis and interpretation of the data collected on cases of acute poisoning by pesticides, a number of relevant information are required.

Epidemiological studies require to take into consideration not only the number of cases poisoned and their medical histories, but also external data useful to compute the ratios. The data required includes:

1. Number of persons who have access to the hospital and or any health care or poison centre in the area enquired (population covered)
2. During the same period of time of the study and in the same place as data collection:
 - a) Number of persons admitted to hospital/health care centre/poison control centre
 - b) Number of persons admitted to hospital/health care centre/poison control centre who died
 - c) Number of persons admitted due to poisoning (caused by all substances including pesticides)
 - d) Number of persons admitted due to poisoning (cause by all substances including pesticides) and who died.
3. Major causes of death in the province/country under study (if possible with the mortality rates)

1.	2.
3.	4.
4. Is it estimated that the area covered by the study represents the situation in the whole country, or is it an under/over estimation of the situation in the country?
5. Kind of agricultural production in the area under study (cash crops, tea, rice, vegetables, livestock production)?

1.	2.
3.	4.
6. Existence of any monitoring programme on pests/integrated pest management/integrated vector management, implemented by farmers or public health institutions?
7. Amount of agrochemicals used in the country/area covered by the study
8. Distribution rural/urban population in the country or the area under study
9. Illiteracy level
10. Gross income per capita

GENERAL INFORMATION

Civil Hospital Bhatinda

1. Number of persons who have access to the hospital and or any health care or poison centre in the area enquired (population covered) About 5 lakh
2. During the same period of time of the study and in the same place as data collection: 1.4.99 to 31.3.2000
 - a) Number of persons admitted to hospital/health care centre/poison control centre 6483
 - b) Number of persons admitted to hospital/health care centre/poison control centre who died 222
 - c) Number of persons admitted due to poisoning (caused by all substances including pesticides)
 - d) Number of persons admitted due to poisoning (caused by all substances including pesticides) and who died.
3. Major causes of death in the province/country under study (if possible with the mortality rates) 1. Infections 2. Ac MI
3. CVAs
4. Is it estimated that the area covered by the study represents the situation in the whole country, or is it an under/over estimation of the situation in the country?
5. Kind of agricultural production in the area under study (cash crops, tea, rice, vegetables, livestock production)? 1. Wheat 2. Rice
3. Cotton 4. Vegetable
6. Existence of any monitoring programme on pests/integrated pest management/integrated vector management, implemented by farmers or public health institutions?
7. Amount of agrochemicals used in the country/ area covered by the study
8. Distribution rural/urban population in the country or the area under study
9. Illiteracy level
10. Gross income per capita

GENERAL INFORMATION

GGH MPMC, GULBARGA

- | | | | | | | | |
|---|---|----------------------|------------------|------------------------|--------------------|---------------|--|
| 1. Number of persons who have access to the hospital and or any health care or poison centre in the area enquired (population covered) | 2.5 lakhs | | | | | | |
| 2. During the same period of time of the study and in the same place as data collection: | | | | | | | |
| a) Number of persons admitted to hospital/health care centre/poison control centre | 12754 | | | | | | |
| b) Number of persons admitted to hospital/health care centre/poison control centre who died | 493 | | | | | | |
| c) Number of persons admitted due to poisoning (caused by all substances including pesticides) | 225 | | | | | | |
| d) Number of persons admitted due to poisoning (caused by all substances including pesticides) and who died. | 24 | | | | | | |
| 3. Major causes of death in the province/country Under study (if possible with the mortality rates) | <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">1. Acute MI</td> <td style="width: 50%;">2. Strokes (CVA)</td> </tr> <tr> <td>3. Infectious diseases</td> <td>4. Poisoning burns</td> </tr> <tr> <td colspan="2">e.g. TB & TBM</td> </tr> </table> | 1. Acute MI | 2. Strokes (CVA) | 3. Infectious diseases | 4. Poisoning burns | e.g. TB & TBM | |
| 1. Acute MI | 2. Strokes (CVA) | | | | | | |
| 3. Infectious diseases | 4. Poisoning burns | | | | | | |
| e.g. TB & TBM | | | | | | | |
| 4. Is it estimated that the area covered by the study represents the situation in the whole country, or is it an under/over estimation of the situation in the country? | <p>No</p> <p>It is under-estimated.</p> | | | | | | |
| 5. Kind of agricultural production in the area under study (cash crops, tea, rice, vegetables, livestock production)? | <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">1. Redgram (Tur dal)</td> <td style="width: 50%;">2. Sugarcane</td> </tr> <tr> <td>3. Jowar</td> <td>4. Groundnut</td> </tr> </table> | 1. Redgram (Tur dal) | 2. Sugarcane | 3. Jowar | 4. Groundnut | | |
| 1. Redgram (Tur dal) | 2. Sugarcane | | | | | | |
| 3. Jowar | 4. Groundnut | | | | | | |
| 6. Existence of any monitoring programme on pests/integrated pest management/integrated vector management, implemented by farmers or public health institutions? | | | | | | | |

7. Amount of agrochemicals used in the country/
area covered by the study
8. Distribution rural/urban population in the
country or the area under study
9. Illiteracy level
10. Gross income per capita

GENERAL INFORMATION

Basaveshwar Teaching & General Hospital, Gulbarga

- | | | |
|---|---|--|
| 1. Number of persons who have access to the hospital and or any health care or poison centre in the area enquired (population covered) | 20 lakhs | |
| 2. During the same period of time of the study and in the same place as data collection: | | |
| a) Number of persons admitted to hospital/health care centre/poison control centre | 5384 | |
| b) Number of persons admitted to hospital/health care centre/poison control centre who died | 309 | |
| c) Number of persons admitted due to poisoning (caused by all substances including pesticides) | 79 | |
| d) Number of persons admitted due to poisoning (caused by all substances including pesticides) and who died. | 14 | |
| 3. Major causes of death in the province/country under study (if possible with the mortality rates) | <div style="display: flex; justify-content: space-between;"> <div> 1. Acute MI
3. TB& TBM </div> <div> 2. Strokes (CVA)
4. Poisoning
Burns </div> </div> | |
| 4. Is it estimated that the area covered by the study represents the situation in the whole country, or is it an under/over estimation of the situation in the country? | No
It is under-estimated. | |
| 5. Kind of agricultural production in the area under study (cash crops, tea, rice, vegetables, livestock production)? | <div style="display: flex; justify-content: space-between;"> <div> 1. Tur/
Red gram
3. Sugarcane </div> <div> 2. Jowar,
Groundnut
4. Vegetables </div> </div> | |
| 6. Existence of any monitoring programme on pests/integrated pest management/integrated vector management, implemented by farmers or public health institutions? | | |
| 7. Amount of agrochemicals used in the country/ area covered by the study | | |

8. Distribution rural/urban population in the country or the area under study
9. Illiteracy level
10. Gross income per capita

GENERAL INFORMATION

Civil Hospital, Sirsa

1.	Number of persons who have access to the hospital and or any health care or poison centre in the area enquired (population covered)	12,13,093	
2.	During the same period of time of the study and in the same place as data collection:		
a)	Number of persons admitted to hospital/health care centre/poison control centre	4059	
b)	Number of persons admitted to hospital/health care centre/poison control centre who died		
c)	Number of persons admitted due to poisoning (caused by all substances including pesticides)	31	
d)	Number of persons admitted due to poisoning (caused by all substances including pesticides) and who died.	14	
3.	Major causes of death in the province/country under study (if possible with the mortality rates)	1. Accidents (Roadside) 3. Respiratory disc pulm. toxins	2. CVA 4. Cardiac disease
4.	Is it estimated that the area covered by the study represents the situation in the whole country, or is it an under/over estimation of the situation in the country?	Nil	
5.	Kind of agricultural production in the area under study (cash crops, tea, rice, vegetables, livestock production)?	1. Cotton 3. Wheat	2. Guar 4. Live stock production
6.	Existence of any monitoring programme on pests/integrated pest management/integrated vector management, implemented by farmers or public health institutions?	—	

7. Amount of agrochemicals used in the country/
area covered by the study

8. Distribution rural/urban population in the
country or the area under study

Rural area – 8,40,212

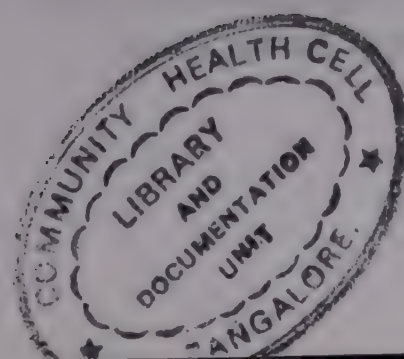
Urban area – 2,42,439

9. Illiteracy level

10. Gross income per capita

G 150

07228



GENERAL INFORMATION

Kakatiya Medical College, Warangal

1. Number of persons who have access to the hospital and or any health care or poison centre in the area enquired (population covered) 20-25 lakhs

2. During the same period of time of the study and in the same place as data collection:
 - a) Number of persons admitted to hospital/health care centre/poison control centre 18294
 - b) Number of persons admitted to hospital/health care centre/poison control centre who died 1594
 - c) Number of persons admitted due to poisoning (caused by all substances including pesticides) 1508
 - d) Number of persons admitted due to poisoning (caused by all substances including pesticides) and who died. 271

3. Major causes of death in the province/country under study (if possible with the mortality rates)

1.	2.
3.	4.

4. Is it estimated that the area covered by the study represents the situation in the whole country, or is it an under/over estimation of the situation in the country?

5. Kind of agricultural production in the area under study (cash crops, tea, rice, vegetables, livestock production)?

1. Rice	2. Vegetables
3. Live stock production	4. Cotton, chillies, Groundnut

6. Existence of any monitoring programme on pests/integrated pest management/integrated vector management, implemented by farmers or public health institutions?

7. Amount of agrochemicals used in the country/ area covered by the study

- | | |
|---|---------------------------|
| 8. Distribution rural/urban population in the country or the area under study | 30:70 in the area covered |
| 9. Illiteracy level | 30% of the area covered. |
| 10. Gross income per capita | |

Statistical Analysis

HARMONIZATION OF CASE DATA COLLECTION ON POISONING BY PESTICIDE

1. Data Collection

Time of data collection : 1st July '1999 to 30th June '2000

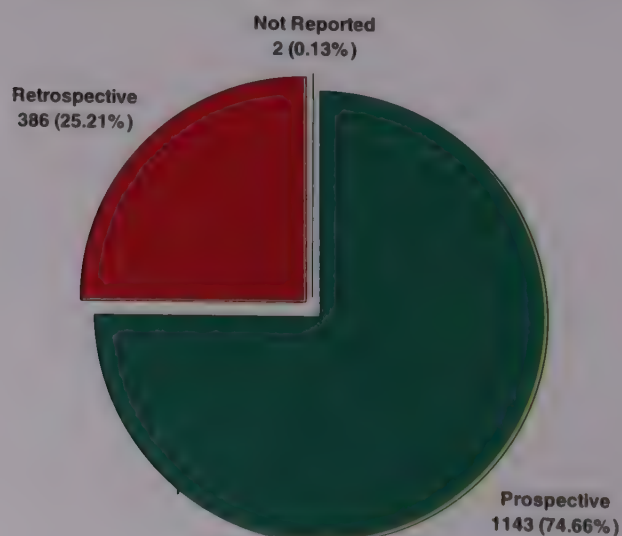
Number of cases recorded : 1531

State/City

State	City
Andhra Pradesh	Warangal
Gujarat	Ahmedabad
	Talod
Haryana	Faridabad
	Faridabad (Ballabgarh)
	Faridkot
	Rohtak
	Sirsa
Karnataka	Gulbarga
Punjab	Bhatinda
	Faridkot

1.1. Type of Case

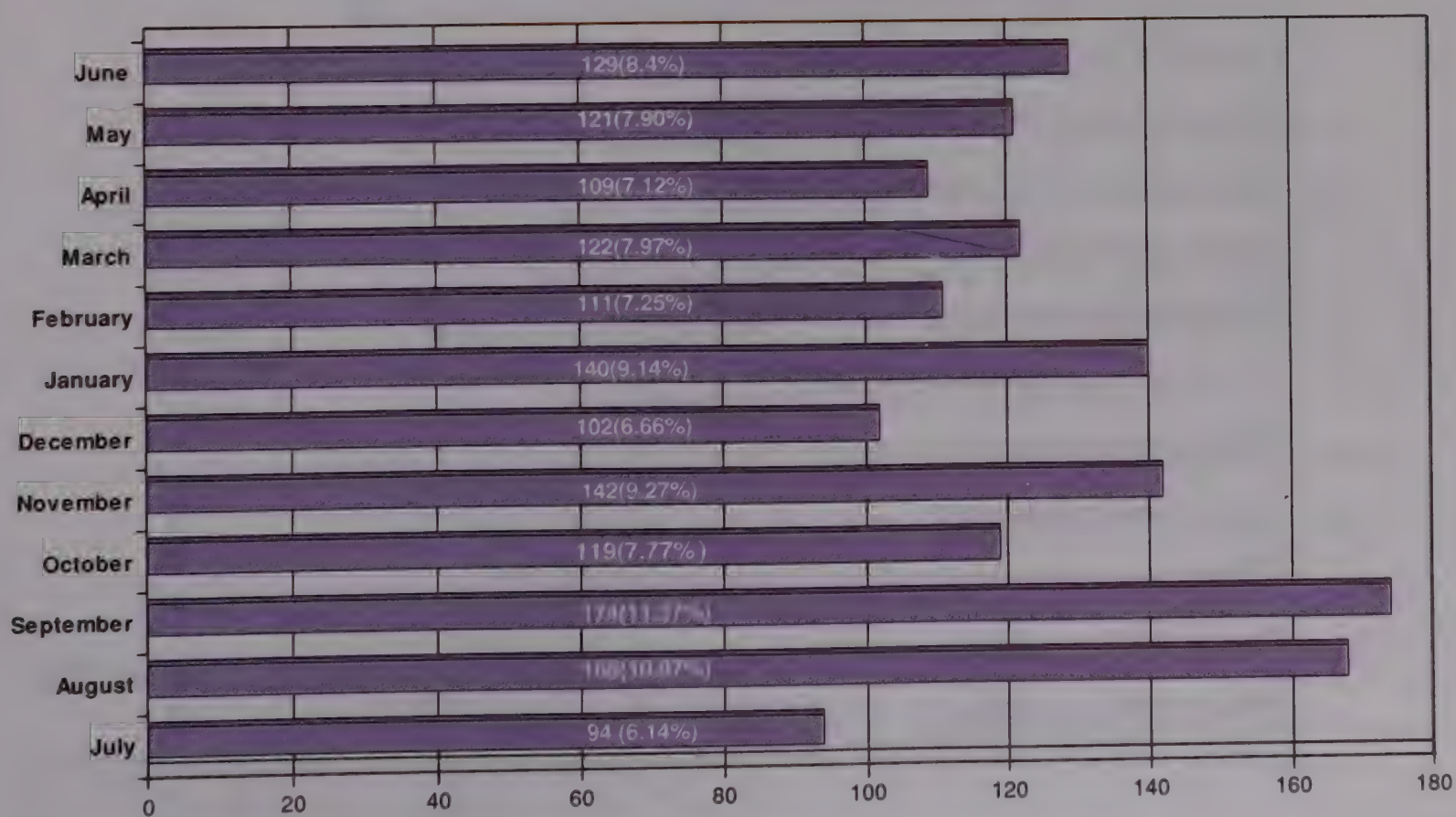
Record Type	No. of Cases
Prospective	1143
Retrospective	386
Not Reported	2
Total	1531



1.2. Seasonal Trends in Pesticide Poisoning

Name of the Month	No. of Cases
July	94
August	168
September	174
October	119
November	142
December	102
January	140
February	111
March	122
April	109
May	121
June	129
Total	1531

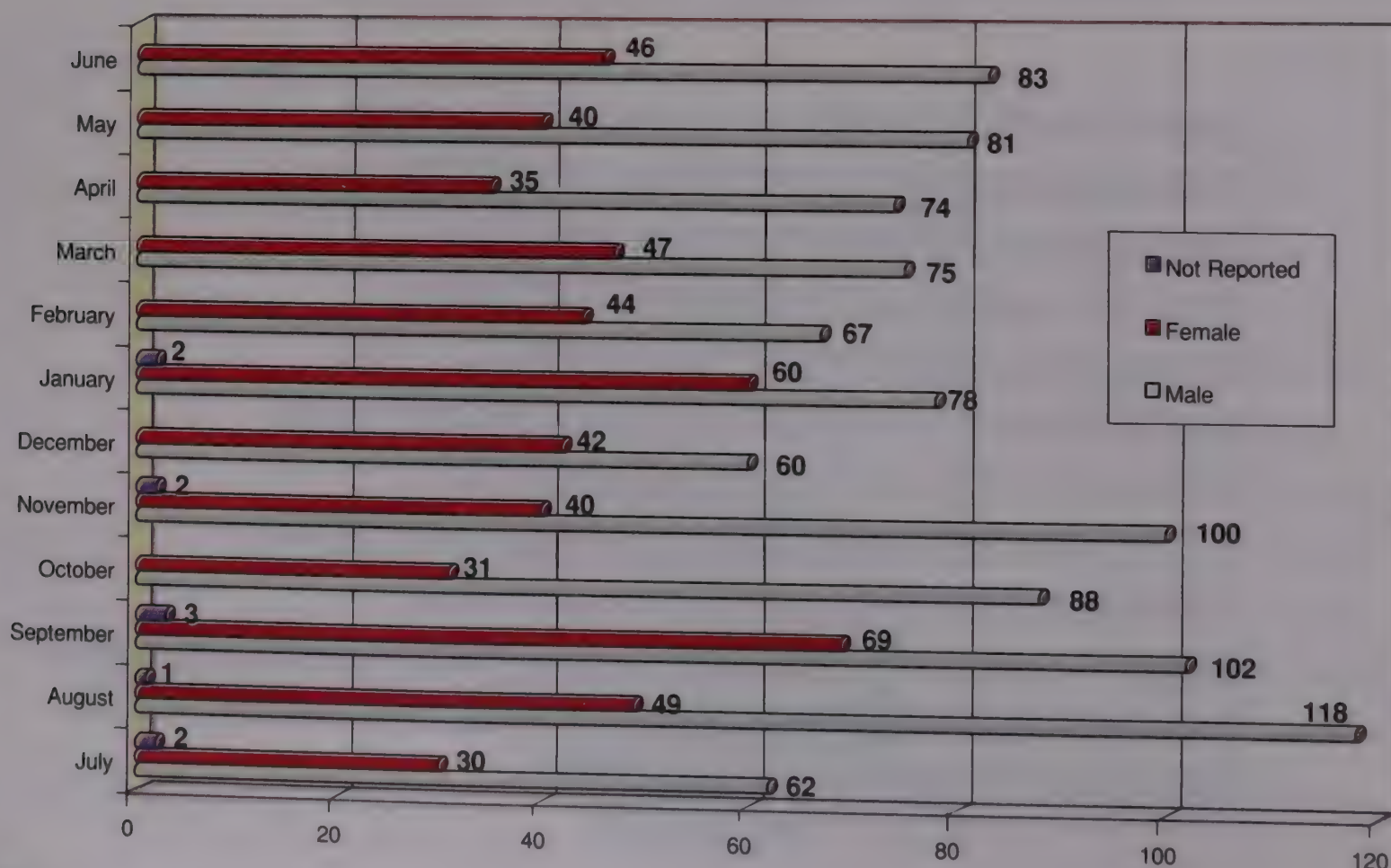
Seasonal Trends in Pesticide Posioning



1.2.1. Seasonal Trends in Pesticide Poisoning Vs Sex Distribution

Name of the Month	Male	Female	Not Reported	Total
July	62	30	2	94
August	118	49	1	168
September	102	69	3	174
October	88	31		119
November	100	40	2	142
December	60	42		102
January	78	60	2	140
February	67	44		111
March	75	47		122
April	74	35		109
May	81	40		121
June	83	46		129
Total	988	533	10	1531

Seasonal Trends in Pesticide Posioning Vs Sex Distribution

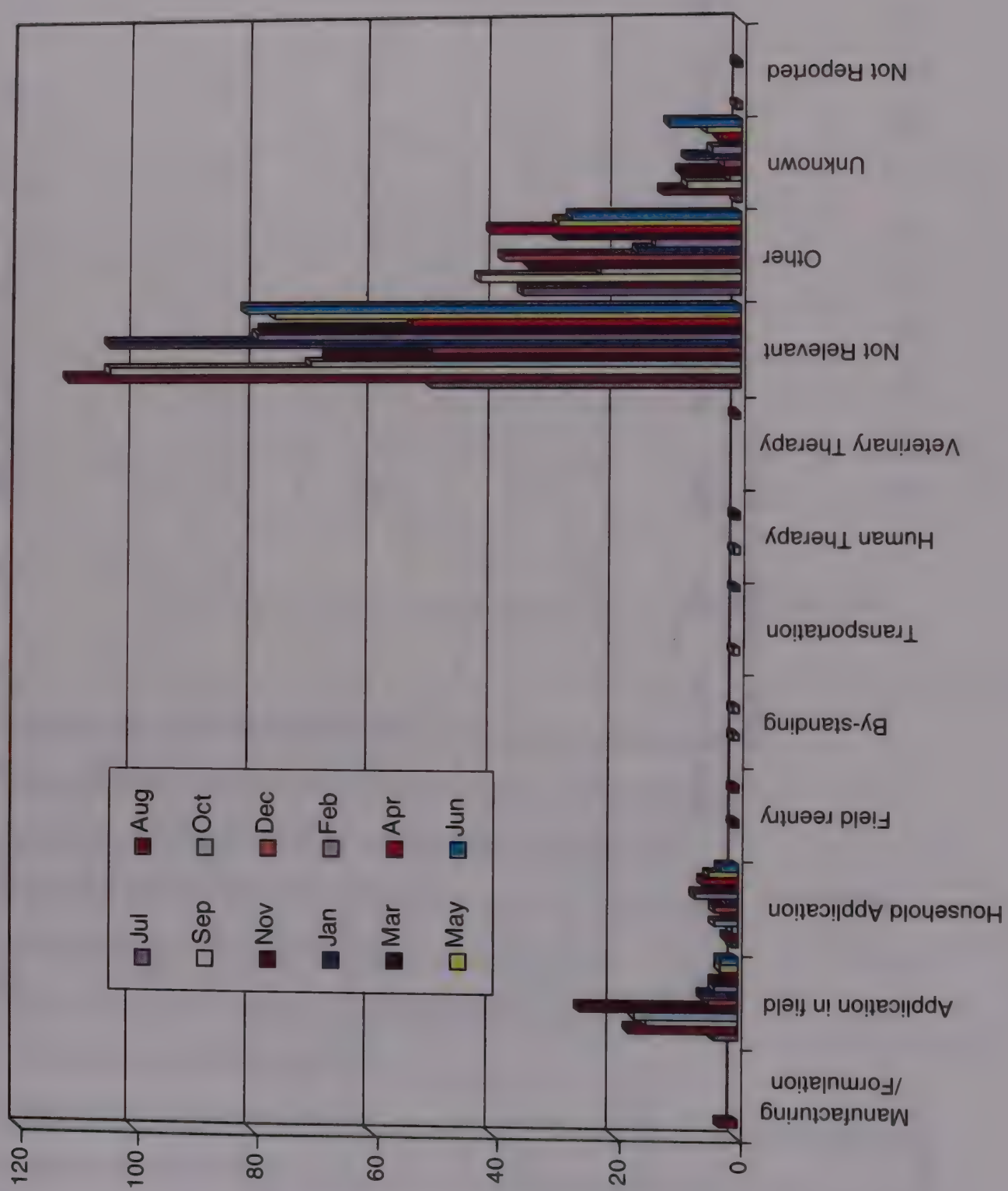


1.3. Activity Vs Month

Main Activity Vs Month

Activity	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	Total
Manufacturing /Formulation		3											3
Application in field	4	18	15	17	26	5	6	4	4	2	3	3	107
Household Application	1	2	1	4	2	4	2	7	5	6	5	3	42
Field reentry					1					1			2
By-standing				1				1					2
Transportation			1									1	2
Human Therapy				1					1				2
Veterinary Therapy										1			1
Not Relevant	51	112	105	71	68	51	105	80	79	54	77	82	935
Other	36	20	43	23	35	39	17	14	30	41	30	28	356
Unknown	1	13	9	2	10	3	9	5	3	4	6	12	77
Not Reported	1						1						2
Total	94	168	174	119	142	102	140	111	122	109	121	129	1531

Main Activity Vs Month

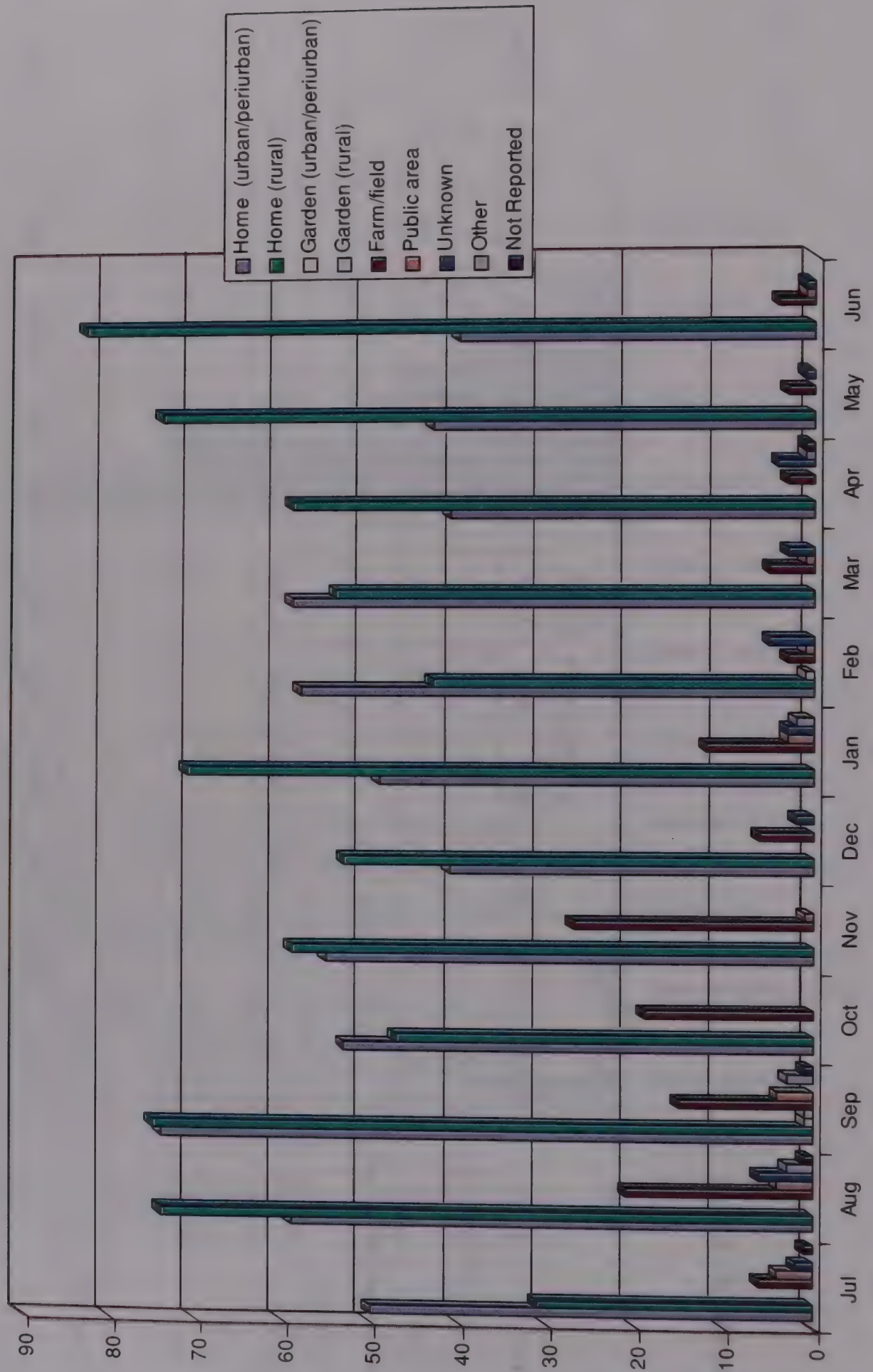


1.4. Location Vs Month

Location Vs Month

Location	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	Total
Home (urban/periurban)	50	59	74	53	55	41	49	58	59	41	43	40	622
Home (rural)	31	74	75	47	59	53	71	43	54	59	74	83	723
Garden (urban/periurban)			1					1					2
Garden (rural)			1										1
Farm/field	6	21	15	19	27	6	12	3	5	3	3	4	124
Public area	4	4	4		1		3	1	1			1	19
Unknown	2	6				2	3	5	3	4	1	1	27
Other		3	3				2			1			9
Not Reported	1	1	1							1			4
Total	94	168	174	119	142	102	140	111	122	109	121	129	1531

Location Vs Month

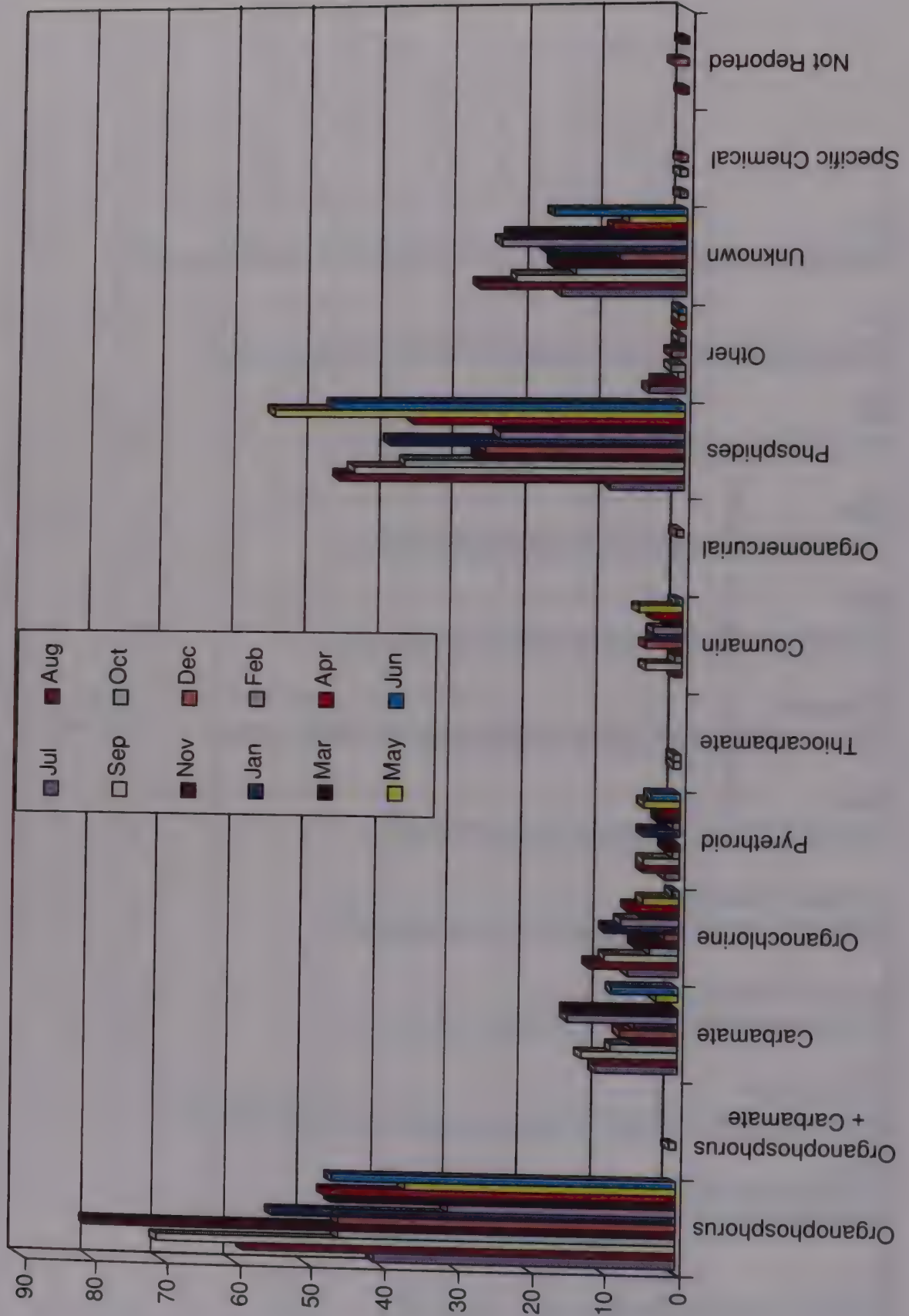


1.5. Chemical Type of Product Vs Month

Chemical Type Vs Month

Chemical Type	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	Total
Organophosphorus	41	59	71	46	81	46	55	31	47	48	37	47	609
Organophosphorus + Carbamate				1									1
Carbamate	11	11	13	9	6	8	6	15	15		3	9	106
Organochlorine	7	12	10	4	6	2	10	8	5	7	5	1	77
Pyrethroid	2	5	5	1	2		5	1	3	2	5	4	35
Thiocarbamate			1	1									2
Coumarin		1	5	1	1	5	4	4	2	4	6	1	34
Organomercurial								1					1
Phosphides	10	47	45	38	28	27	40	25	25	37	56	48	426
Other	5	4	1	2		2	1	1		1	1	1	19
Unknown	17	28	23	15	18	9	19	25	24	10	8	18	214
Specific Chemical	1			1		1							3
Not Reported		1				2			1				4
Total	94	168	174	119	142	102	140	111	122	109	121	129	1531

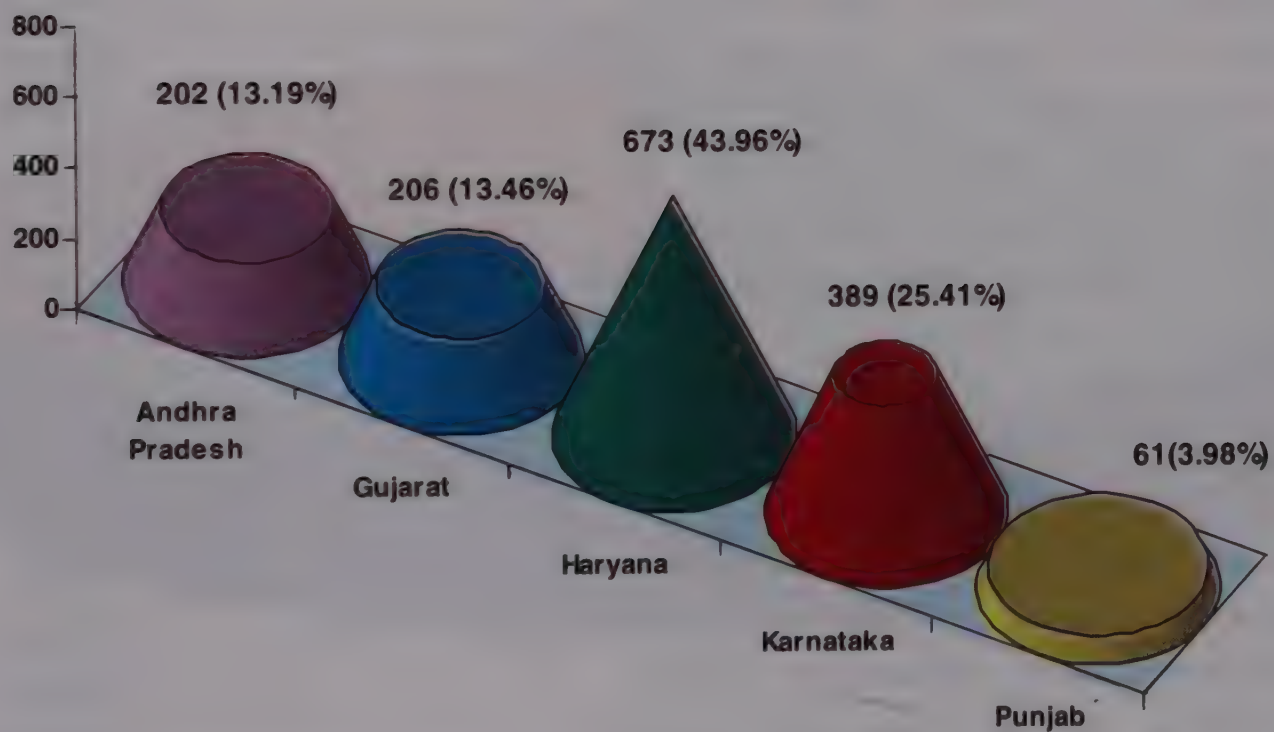
Chemical Type Vs Month



1.6. No. of Cases in each State

State	No. of Cases
Andhra Pradesh	202
Gujarat	206
Haryana	673
Karnataka	389
Punjab	61
Total	1531

No of Cases in each State



2. Communication

2.1. Sources of Information

Name of Institution	Type
BTGH MRMC, Gulbarga, Karnataka	Private
Ayushi Family Hospital, Talod, Gujarat	Private
B.K. Hospital, Faridabad, Haryana	Governmental
Civil Hospital, Sirsa, Haryana	Governmental
Civil Hospital, Ahmedabad, Gujarat	Governmental
Civil Hospital, Bhatinda, Punjab	Governmental
Escorts Hospital & Research Centre (EHRC), Faridabad, Haryana	Private
G.G.S. Medical College, Faridkot, Punjab	Governmental
GGH, MRMC, Gulbarga, Karnataka	Governmental
Government Hospital, Ballabgarh, Haryana	Governmental
Government Hospital, Palwal, Haryana	Governmental
Jeevraj Mehta Hospital, Ahmedabad, Gujarat	Private
Karnavati Hospital, Ahmedabad, Gujarat	Private
L.G. Hospital, Ahmedabad, Gujarat	Governmental
Lifeline Hospital, Ahmedabad, Gujarat	Private
MGM Hospital, Warangal, Andhra Pradesh	Governmental
PGIMS, Rohtak, Haryana	Governmental
Prarthna Hospital, Ahmedabad, Gujarat	Private
Private Clinic, Ahmedabad, Gujarat	Private
Rajasthan hospital, Ahmedabad, Gujarat	Private
Sahara Hospital, Ahmedabad, Gujarat	Private
Sanjivani Hospital, Ahmedabad, Gujarat	Private
Shantam Hospital, Ahmedabad, Gujarat	Private
Shardaben Hospital, Ahmedabad, Gujarat	Governmental
Shardaben Hospital, Ahmedabad, Gujarat	Private
Sushrusha Hospital, Ahmedabad, Gujarat	Private
V.S.Hospital, Ahmedabad, Gujarat	Governmental
V.S.Hospital, Ahmedabad, Gujarat	Private

2.2. Category of Person[s] supplying Information

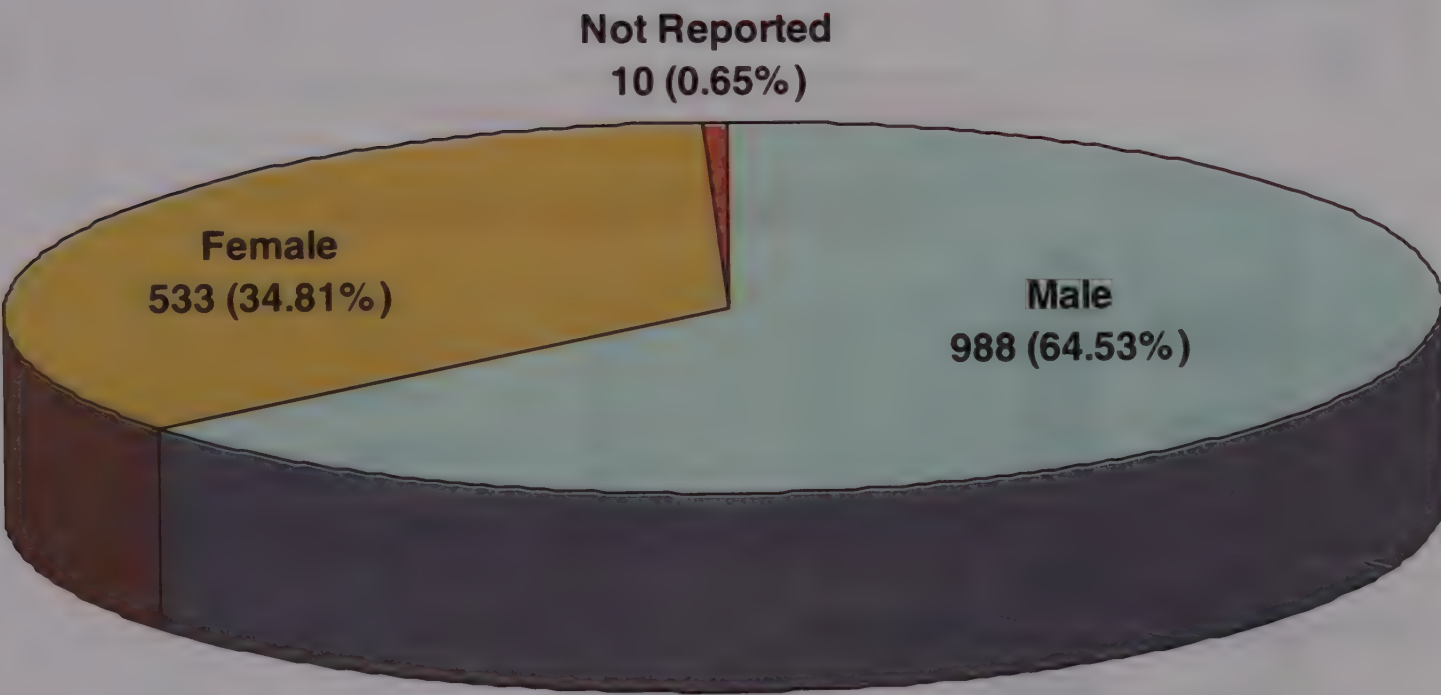
Category	Number
Medical Professional	1529
Paramedical	2
Total Number of Cases	1531

3. Patient Details

3.1. Sex Distribution

Sex	No. of Cases
Male	988
Female	533
Not Reported	10
Total	1531

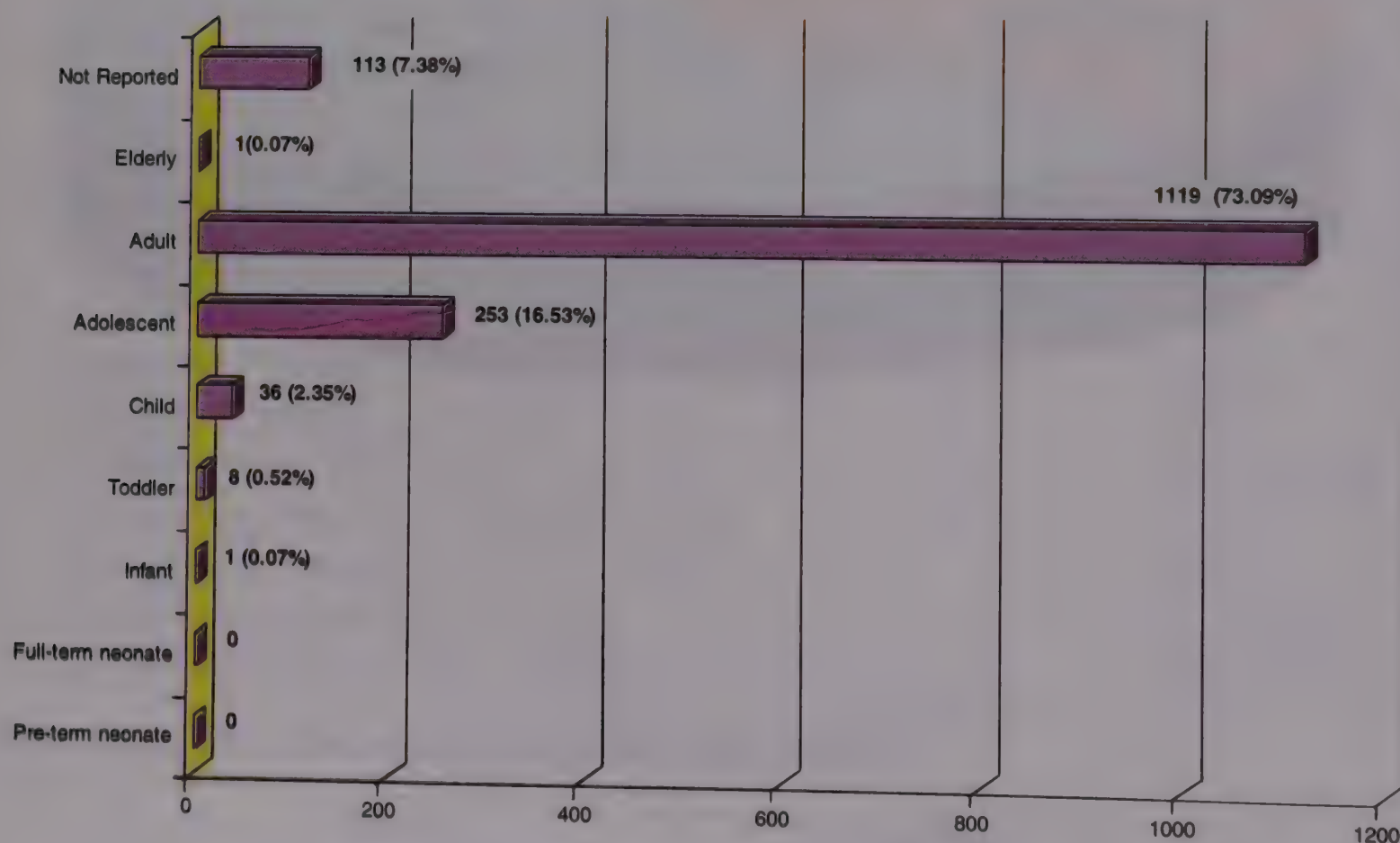
Sex Distribution



3.2. Age Distribution

Age Groups of Population surveyed (India)		
Pre-term neonate	Born at any time before the 37th completed week of gestation.	0
Full-term neonate	Born at any time from the beginning of the 38th week of gestation, up to 4 weeks post birth.	0
Infant	4 Weeks-12 Months	1
Toddler	1-4 Years	8
Child	5-14 Years	36
Adolescent	15-19 Years	253
Adult	20-74 Years	1119
Elderly	75 Years and more	1
Not reported		113
Total		1531

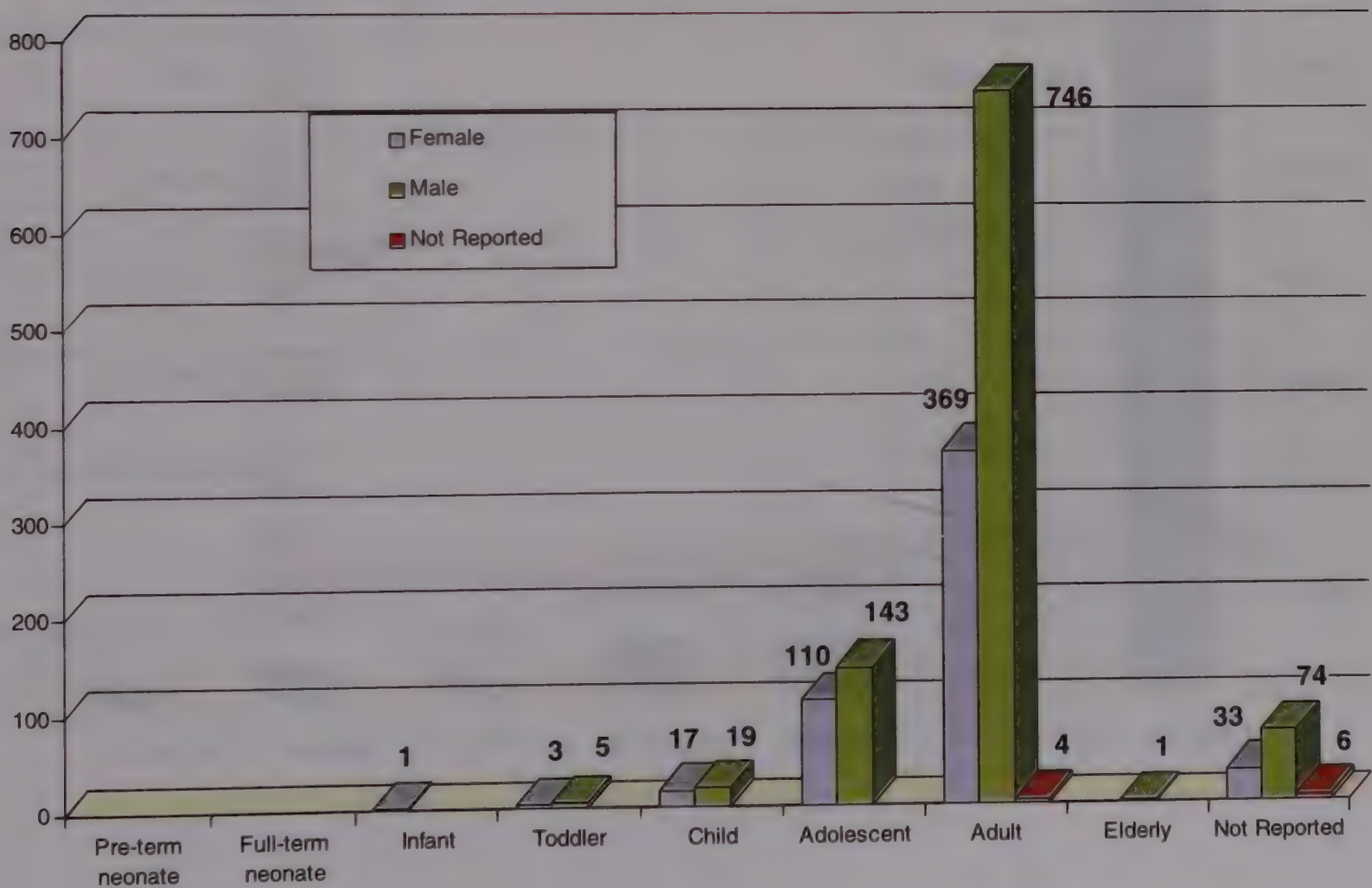
Age Groups of Population Surveyed



3.2.1. Age Group & Sex Distribution

Age Groups	Female	Male	Not Reported	Total
Pre-term neonate				0
Full-term neonate				0
Infant	1			1
Toddler	3	5		8
Child	17	19		36
Adolescent	110	143		253
Adult	369	746	4	1119
Elderly		1		1
Not Reported	33	74	6	113
Total	533	988	10	1531

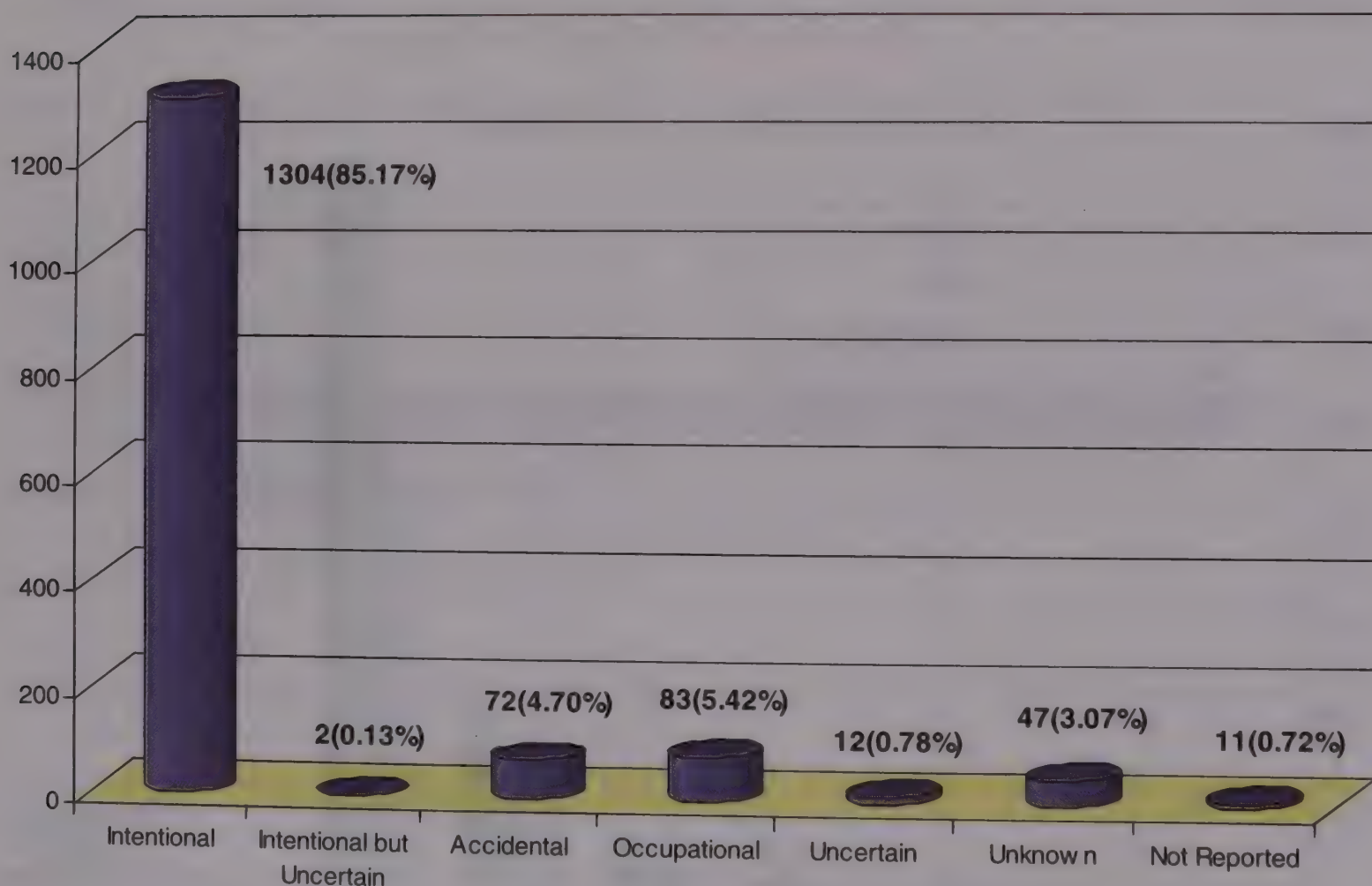
Age Groups Vs Sex Distribution



4.0. Circumstances of Exposure (Poisoning)

Circumstances	No. of Cases
Intentional	1304
Intentional but Uncertain	2
Accidental	72
Occupational	83
Uncertain	12
Unknown	47
Not Reported	11
Total	1531

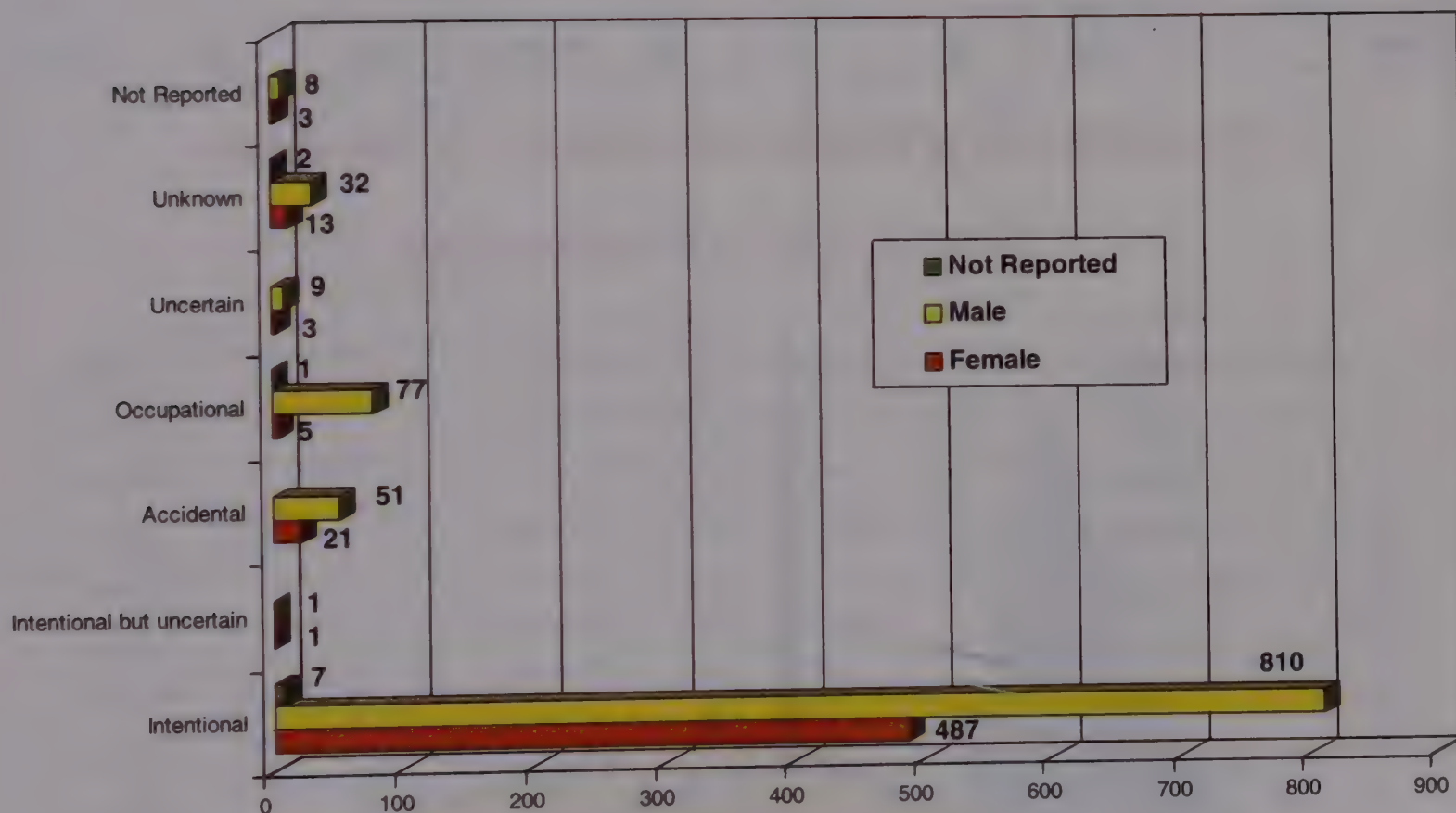
Circumstances of Exposure (Poisoning)



4.1. Circumstances of Exposure (Poisoning) Vs Sex Distribution

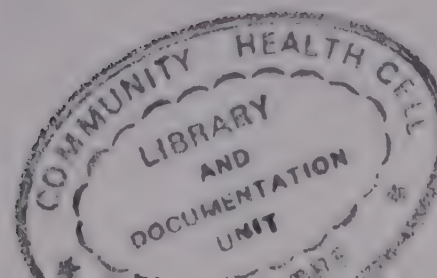
Circumstances	Female	Male	Not Reported	Total
Intentional	487	810	7	1304
Intentional but uncertain	1	1		2
Accidental	21	51		72
Occupational	5	77	1	83
Uncertain	3	9		12
Unknown	13	32	2	47
Not Reported	3	8		11
Total	533	988	10	1531

Circumstances of Poisoning Vs Sex Distribution



E-150

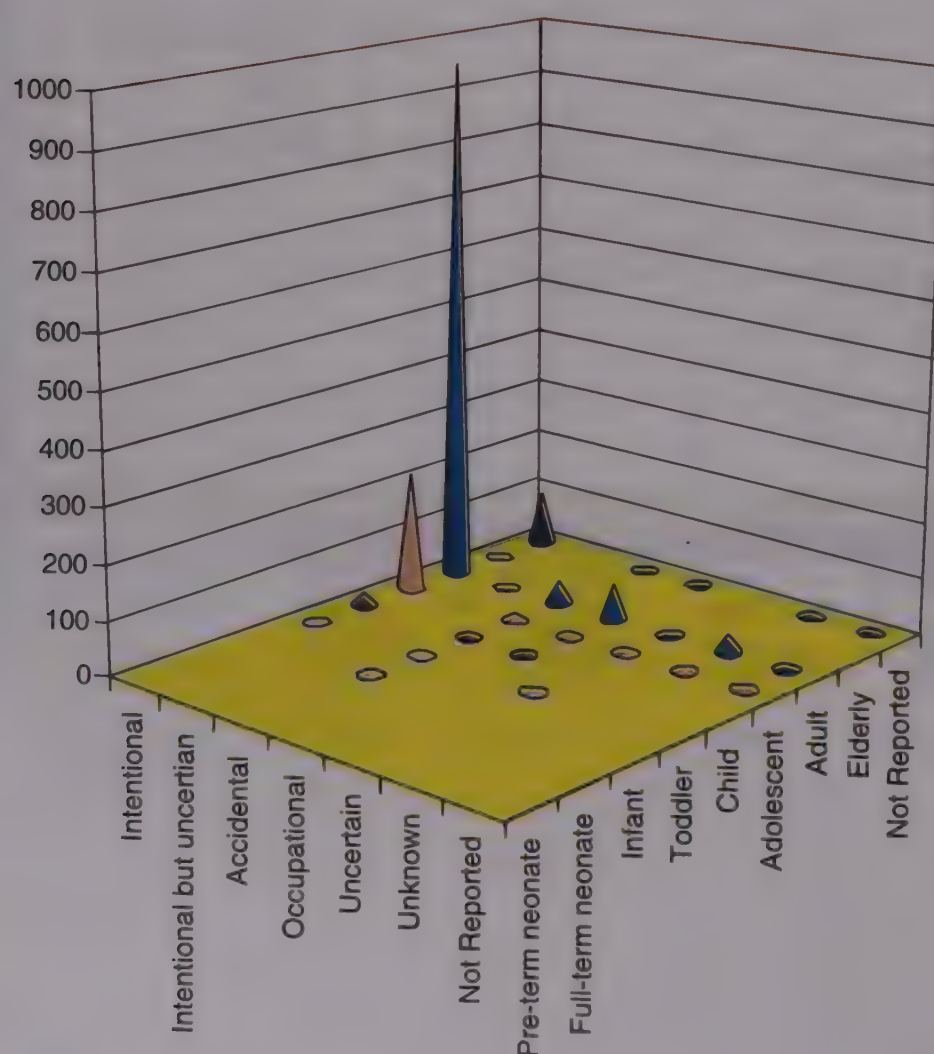
07228



4.2. Circumstances of Exposure (Poisoning) Vs Age Groups

Age Groups	Inten- tional	Inten- tional but un- certain	Acci- dental	Occupa- tional	Un- certain	Un- known	Not Reported	Total
Pre-term neonate								0
Full-term neonate								0
Infant			1					1
Toddler	2		5		1			8
Child	25		10	1				36
Adolescent	220		12	9	1	8	3	253
Adult	958	2	40	67	10	35	7	1119
Elderly	1							1
Not Reported	98		4	6		4	1	113
Total	1304	2	72	83	12	47	11	1531

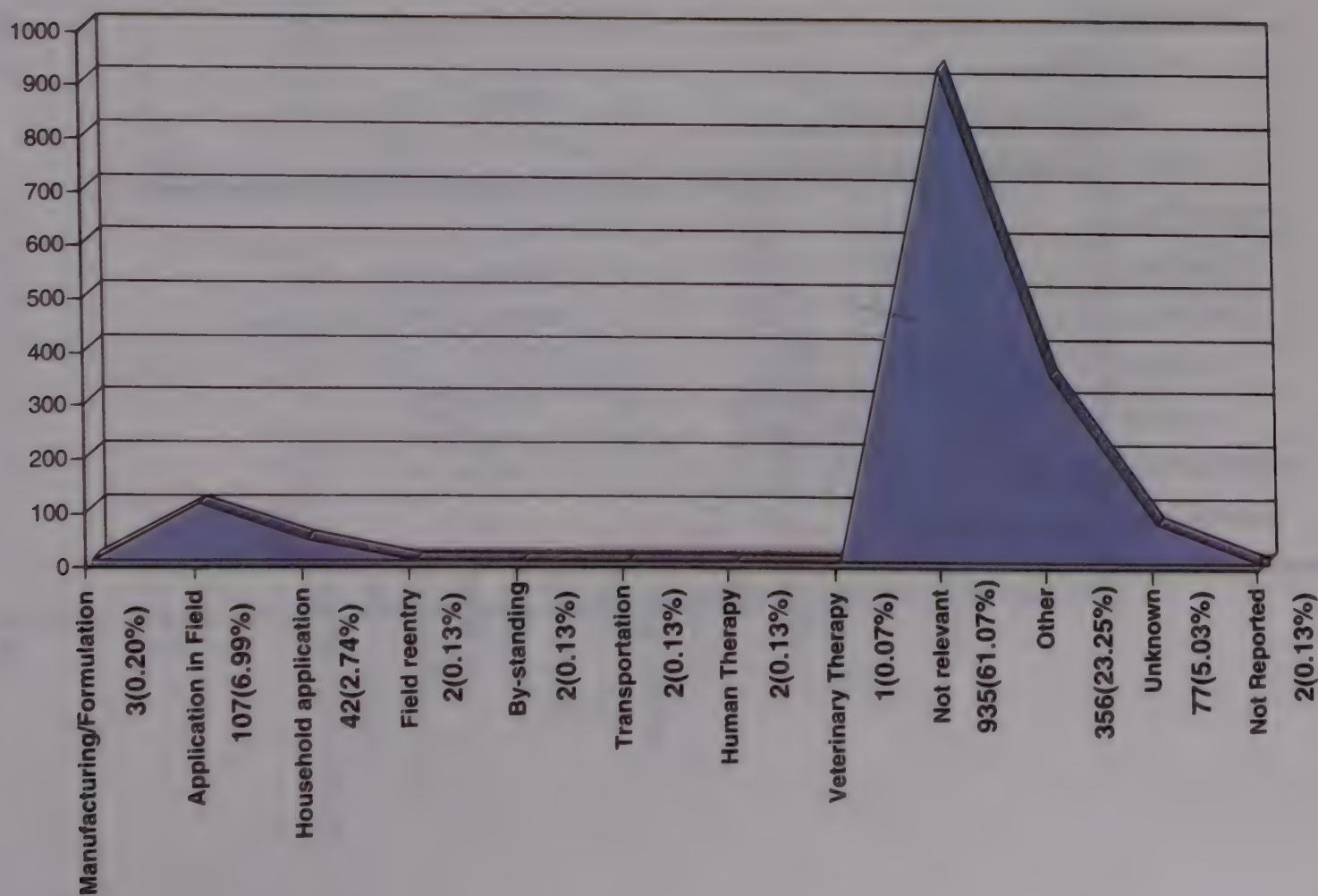
Circumstances of Exposure (Poisoning) Vs Age Group



5.0. Main Activity at the Time of Exposure

Activity	No. of Cases
Manufacturing/Formulation	3
Application in Field	107
Household application	42
Field reentry	2
By-standing	2
Transportation	2
Human Therapy	2
Veterinary Therapy	1
Not relevant	935
Other	356
Unknown	77
Not Reported	2
Total	1531

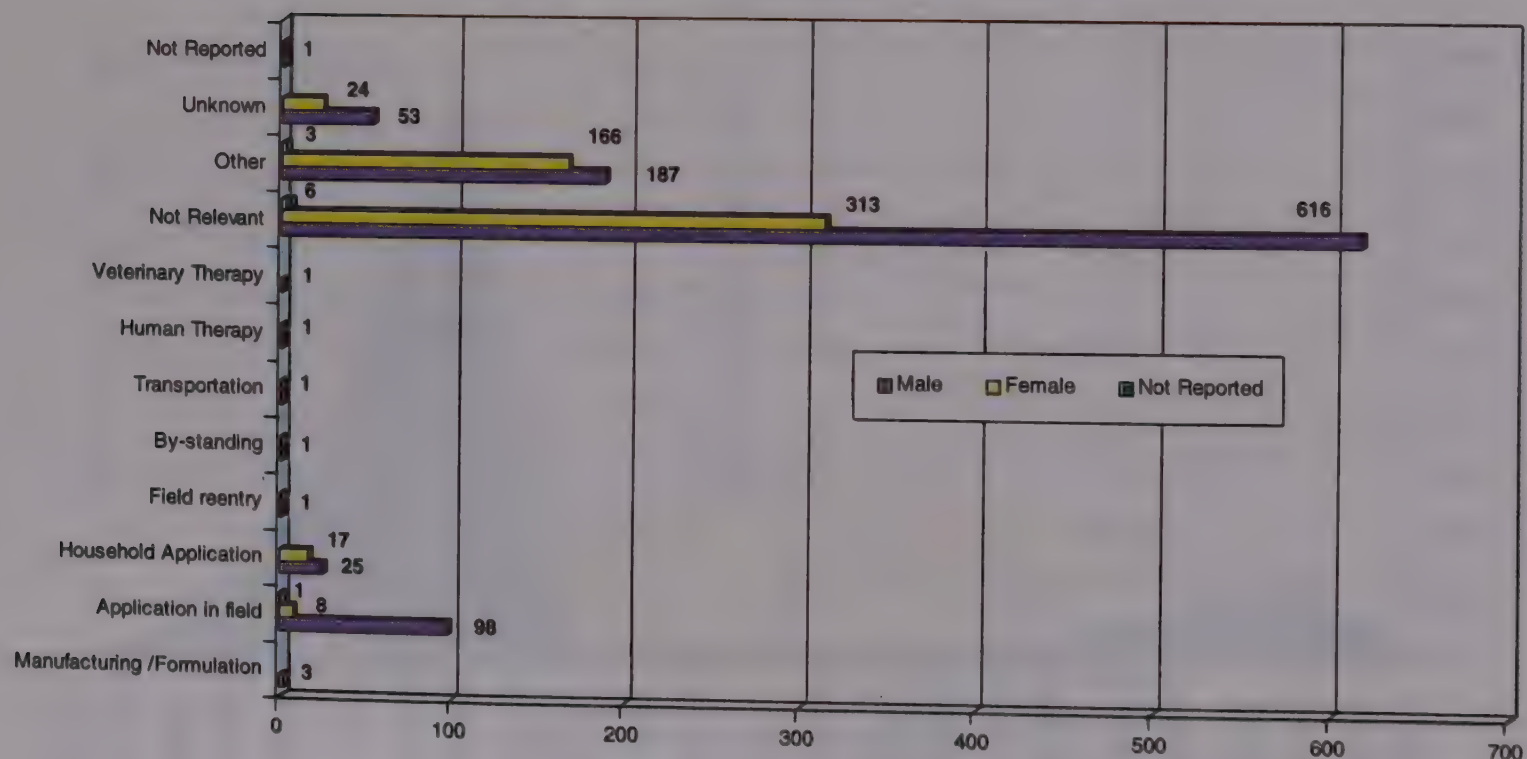
Main Activity at the Time of Exposure



5.1. Main Activity at the Time of Exposure Vs Sex Distribution

Exposure Activity	Male	Female	Not Reported	Total
Manufacturing /Formulation	3			3
Application in field	98	8	1	107
Household Application	25	17		42
Field reentry	1	1		2
By-standing	1	1		2
Transportation	1	1		2
Human Therapy	1	1		2
Veterinary Therapy	1			1
Not Relevant	616	313	6	935
Other	187	166	3	356
Unknown	53	24		77
Not Reported	1	1		2
Total	988	533	10	1531

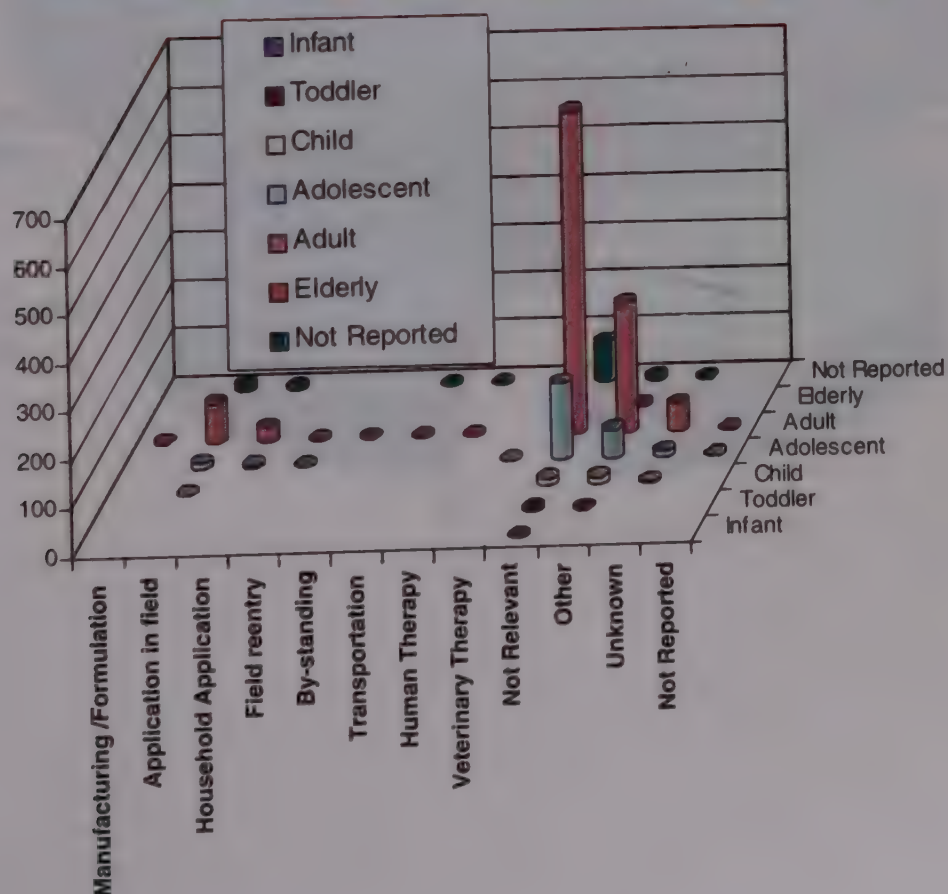
Main Activity at the Time of Exposure Vs Sex Distribution



5.2. Main Activity at the Time of Exposure Vs Age Groups

Exposure Activity	Infant	Toddler	Child	Adole- scent	Adult	Elderly	Not Reported	Total
Manufacturing/ Formulation					3			3
Application in field			1	13	82		11	107
Household Application				5	31		6	42
Field reentry				1	1			2
By-standing					2			2
Transportation					1		1	2
Human Therapy					1		1	2
Veterinary Therapy				1				1
Not Relevant	1	5	14	159	672		84	935
Other		3	17	60	268	1	7	356
Unknown			4	13	57		3	77
Not Reported				1	1			2
Total	1	8	36	253	1119	1	113	1531

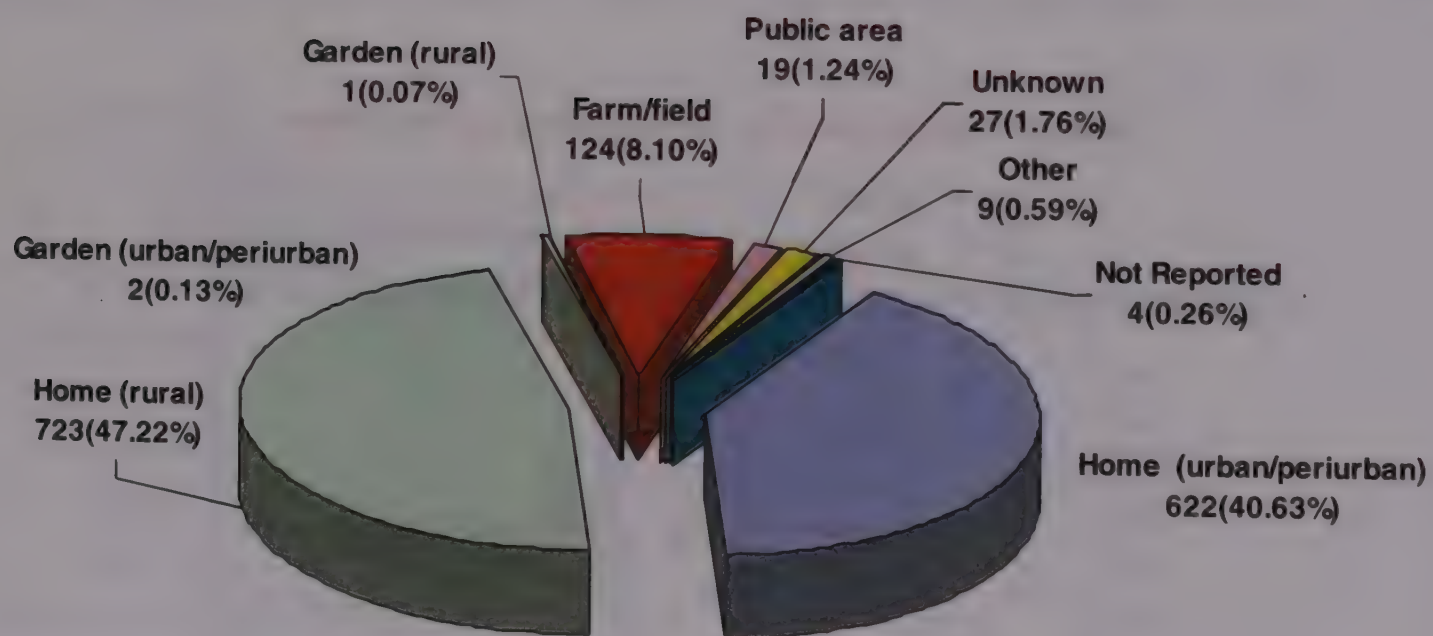
Main Activity at the Time of Exposure Vs Age Group



6.0. Location of Exposure

Location of Exposure	No. of Cases
Home (urban/periurban)	622
Home (rural)	723
Garden (urban/periurban)	2
Garden (rural)	1
Farm/field	124
Public area	19
Unknown	27
Other	9
Not Reported	4
Total	1531

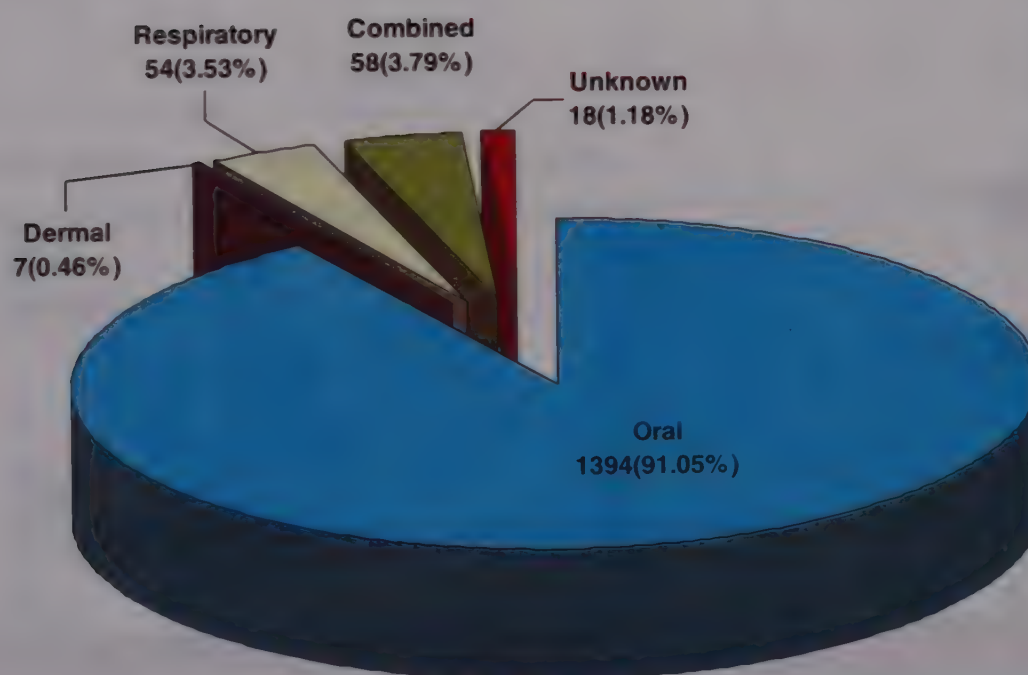
Location of Exposure



7.0. Routes of Exposure

Routes of Exposure	No. of Cases
Oral	1394
Dermal	7
Respiratory	54
Combined	58
Unknown	18
Total	1531

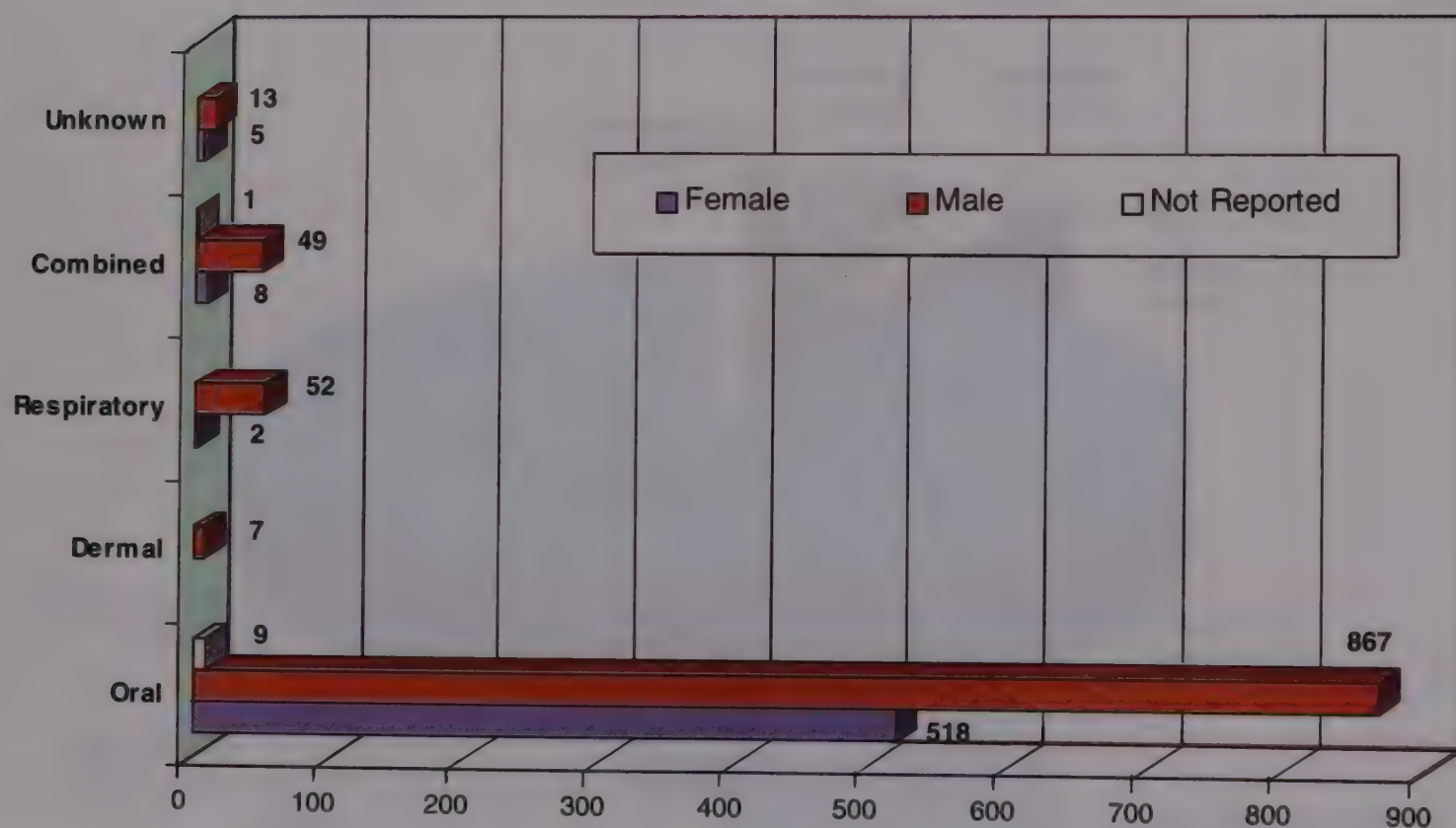
Routes of Exposure



7.1. Routes of Exposure Vs Sex distribution

Route of Exposure	Female	Male	Not Reported	Total
Oral	518	867	9	1394
Dermal		7		7
Respiratory	2	52		54
Combined	8	49	1	58
Unknown	5	13		18
Total	533	988	10	1531

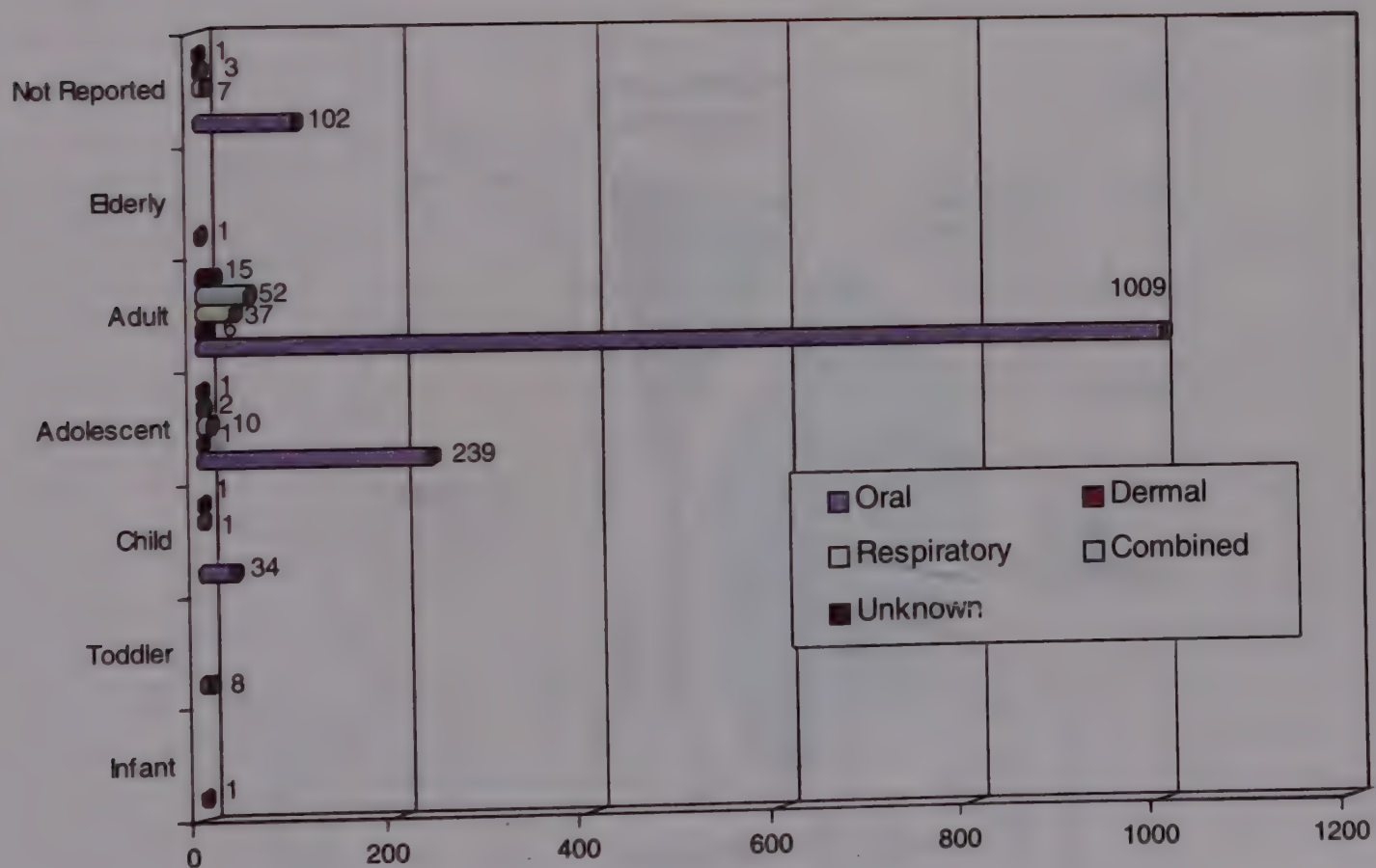
Route of Exposure Vs Sex Distribution



7.2. Routes of Exposure Vs Age Groups

Age Groups	Oral	Dermal	Respiratory	Combined	Unknown	Total
Infant	1					1
Toddler	8					8
Child	34			1	1	36
Adolescent	239	1	10	2	1	253
Adult	1009	6	37	52	15	1119
Elderly	1					1
Not Reported	102		7	3	1	113
Total	1394	7	54	58	18	1531

Routes of Exposure Vs Age Groups

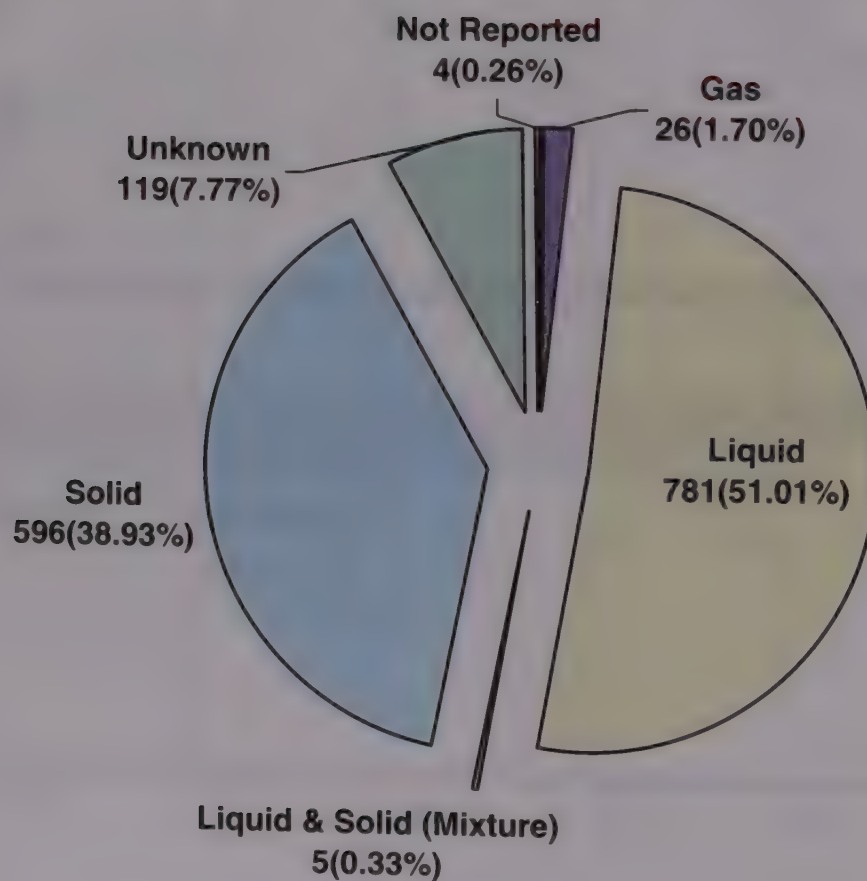


8. Product Identity

8.1. Physical form of Product

Product Form	Numbers
Gas	26
Liquid	781
Liquid & Solid (Mixture)	5
Solid	596
Unknown	119
Not Reported	4
Total	1531

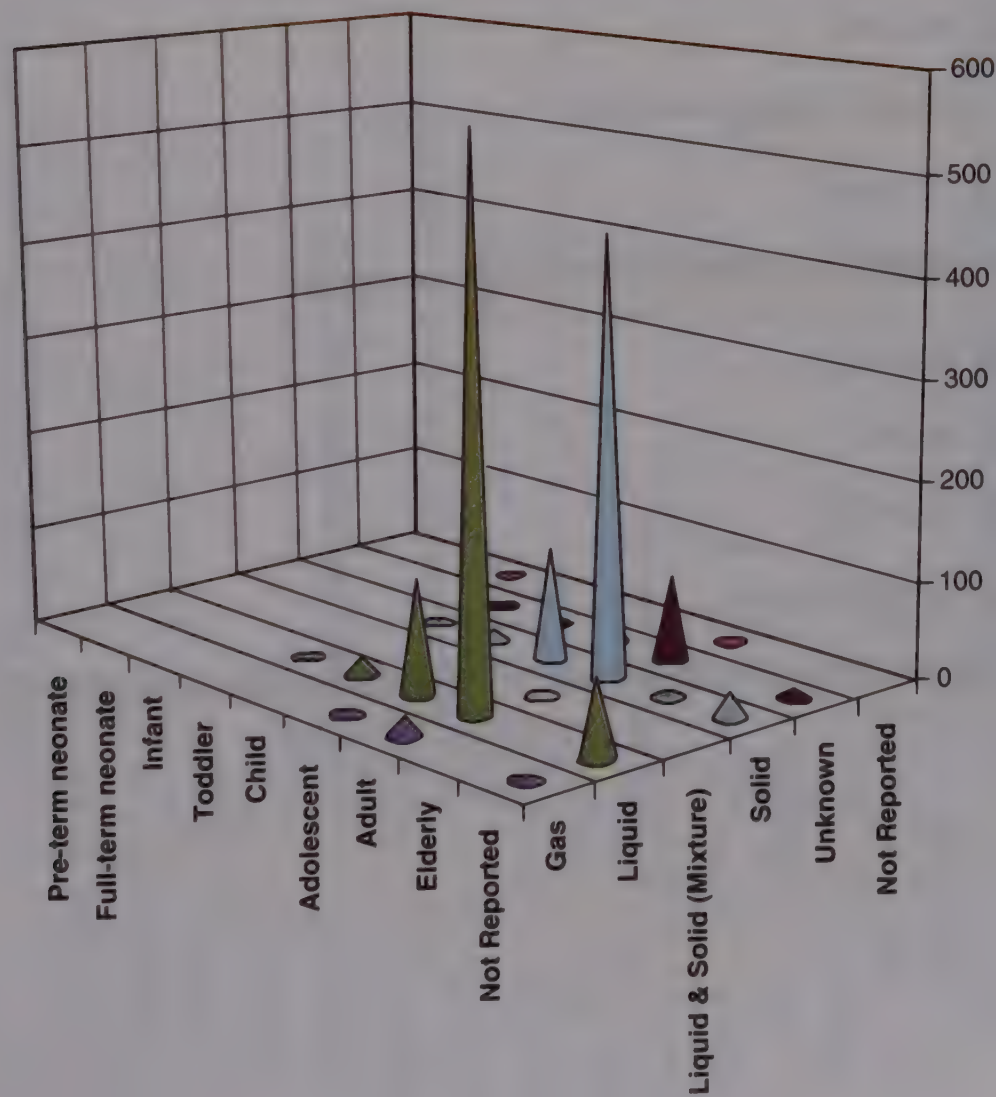
Physical Form of Product



8.1.1. Physical form of Product Vs Age Groups

Age Groups	Gas	Liquid	Liquid & Solid	Solid	Unknown	Not Reported	Total
Pre-term neonate							0
Full-term neonate							0
Infant						1	1
Toddler		5		2	1		8
Child		19		12	5		36
Adolescent	5	117		113	18		253
Adult	20	562	5	443	86	3	1119
Elderly				1			1
Not Reported	1	78		25	9		113
Total	26	781	5	596	119	4	1531

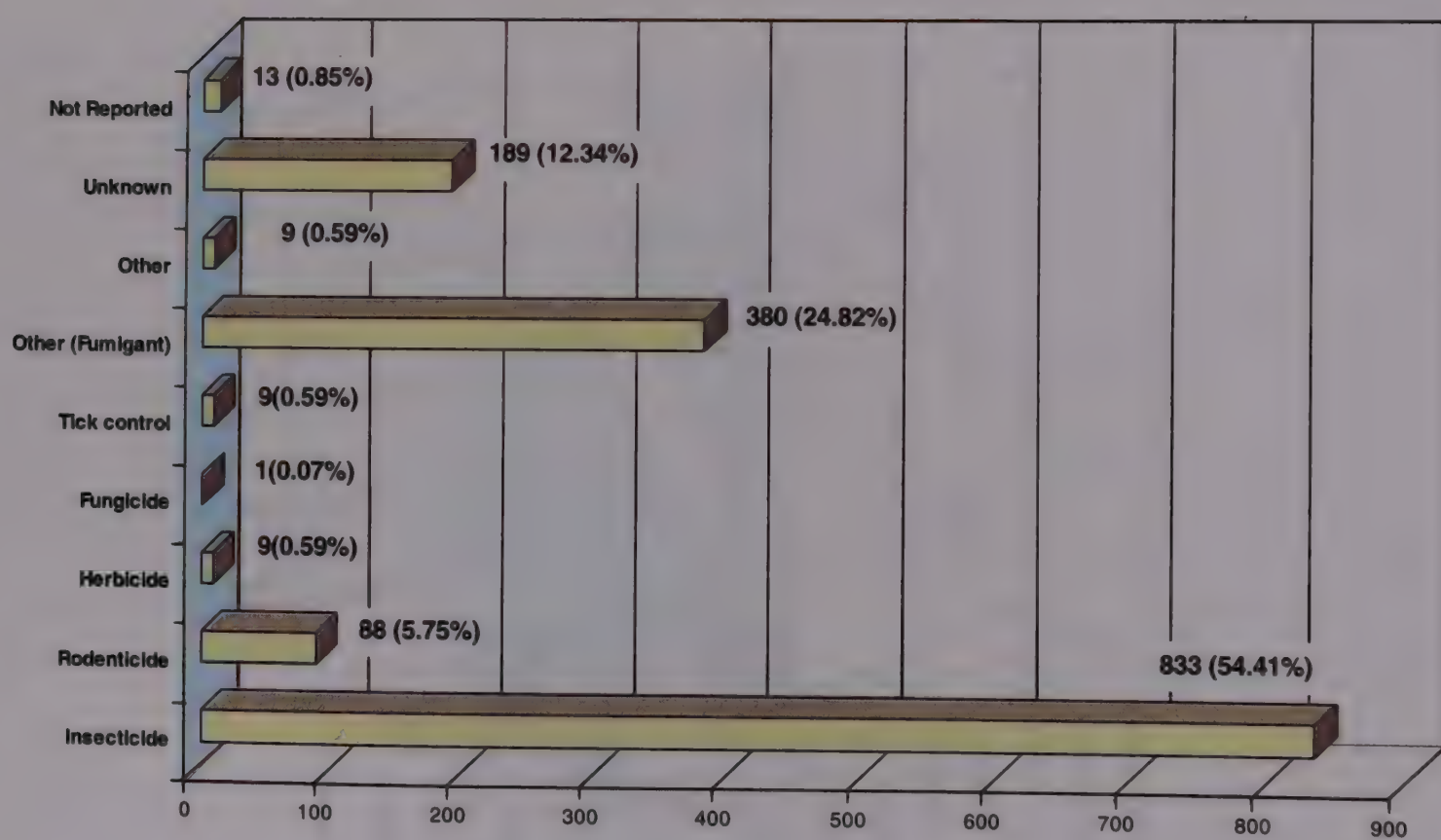
Physical Form of Product Vs Age Groups



8.2. Actual Use of Product

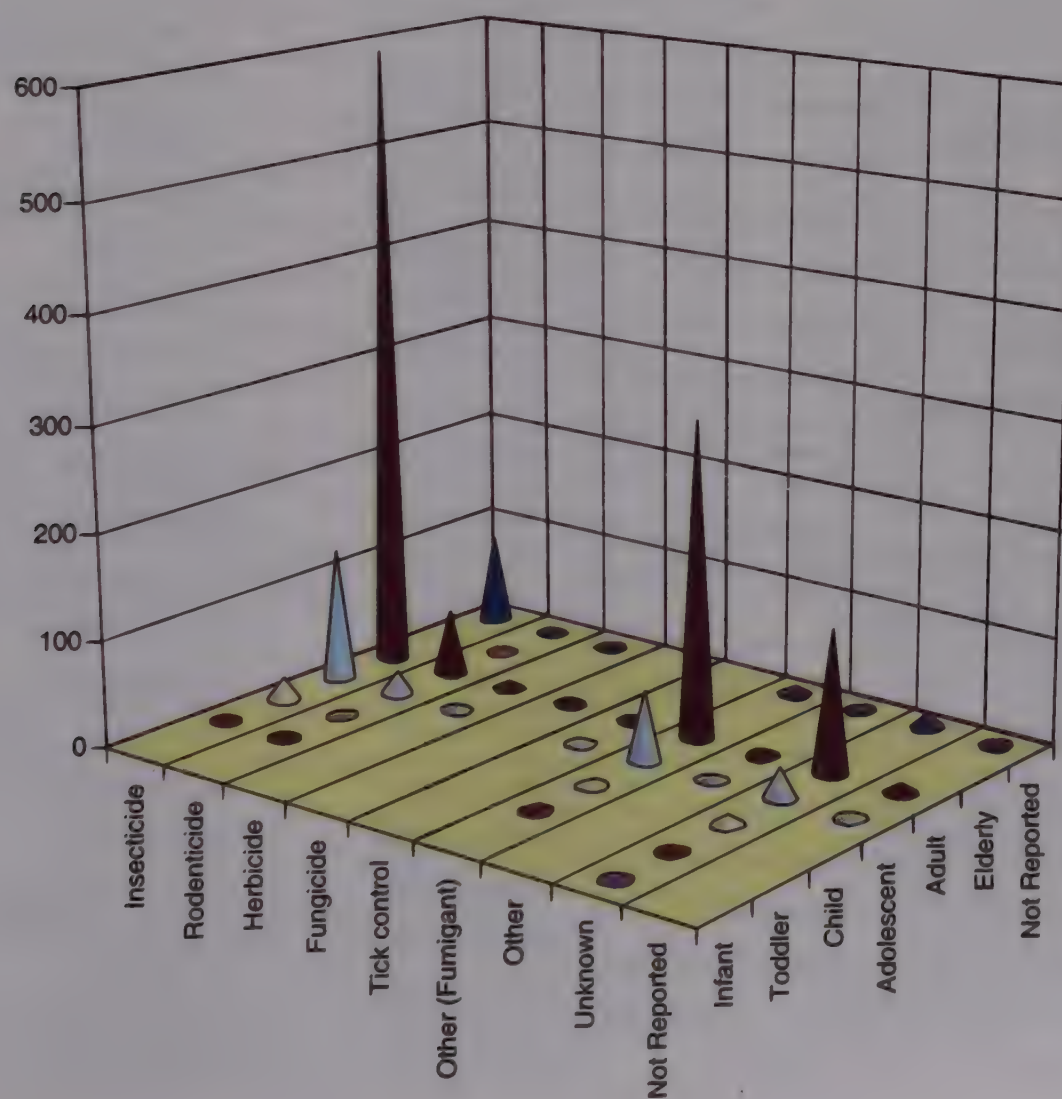
Actual use of the Product	No. of Cases
Insecticide	833
Rodenticide	88
Herbicide	9
Fungicide	1
Tick control	9
Other (Fumigant)	380
Other	9
Unknown	189
Not Reported	13
Total	1531

Actual Use of Product



8.2.1. Actual use of Pesticide Vs Age Groups

Product Use	Infant	Toddler	Child	Adolescent	Adult	Elderly	Not Reported	Total
Insecticide		6	21	127	595		84	833
Rodenticide		0	0	22	61	1	4	88
Herbicide				1	7		1	9
Fungicide					1			1
Tick control				4	5			9
Other (Fumigant)		1	5	67	299		8	380
Other				1	6		2	9
Unknown	1	1	10	29	135		13	189
Not Reported				2	10		1	13
Total	1	8	36	253	1119	1	113	1531



8.3. Products Actual Use Vs Use Intended

Product Name	Actual Use	Use Intended	No. of Cases
2,4-D+DDT	Herbicide	Combination	1
Acephate	Insecticide	Insecticide	2
Aldrin	Insecticide	Insecticide	4
All Out Mosquito repellent	Other	Household	1
Aluminium phosphide	Fumigant	Fumigant	378
Anaconda 505 + Chlorpyriphos 50% + Cypermethrin 5% EC	Insecticide	Combination	1
Anilofos	Insecticide	Insecticide	1
Arthrin	Insecticide	Insecticide	1
ASTAF	Insecticide	Unknown	2
Astaf Powder	Insecticide	Unknown	2
Baygon	Insecticide	Household	93
Baygon & Rat Powder	Rodenticide	Combination	1
Baygon Granules (Bait)	Insecticide	Household	1
Baygon Powder	Insecticide	Household	2
Baygon Spray	Insecticide	Household	1
Baygon+Dimethoate	Insecticide	Combination	1
BHC	Insecticide	Insecticide	1
Butachlor	Insecticide	Insecticide	1
Butox (Deltamethrin)	Tick control	Insecticide	1
Carbaryl	Insecticide	Insecticide	1
Carbendazim	Fungicide	Fungicide	1
Carbofuran	Insecticide	Insecticide	1
Celphos + Alcohol	Insecticide	Combination	1
Centrek (Chlorpyriphos)	Insecticide	Insecticide	1
Chlorophos	Insecticide	Insecticide	1
Chlorpyriphos	Insecticide	Insecticide	18
Chlorpyriphos + Cypermethrin	Insecticide	Combination	1
Chlorpyriphos + Mancozeb	Insecticide	Combination	2
Copper Sulphate	Other	Fungicide	4
Crogor	Unknown	Unknown	1
Cypermethrin	Insecticide	Insecticide	20
DDT	Insecticide	Insecticide	10
DDT/Aldrin	Insecticide	Combination	1
Deltamethrin	Insecticide	Insecticide	2
Dichlorovos	Insecticide	Insecticide	2
Diethyl Ether	Insecticide	Insecticide	1

Product Name	Actual Use	Use Intended	No. of Cases
Dimethoate	Insecticide	Insecticide	17
Dimethyl Phthoate	Insecticide	Insecticide	1
Doom (DDVP) Furadon Granules	Insecticide	Combination	1
Edifenphos	Insecticide	Insecticide	1
Endosulfan	Insecticide	Insecticide	34
Endosulfan + Cypermethrin	Insecticide	Combination	1
Endosulfan+Cypermethrin etc.	Insecticide	Combination	1
Endrin	Insecticide	Insecticide	6
Endrin Tablets	Insecticide	Insecticide	13
Ethion	Insecticide	Insecticide	3
Ethylene Dibromide	Insecticide	Fumigant	2
Fenitrothion	Insecticide	Insecticide	1
Fenvalerate	Insecticide	Insecticide	5
Finit	Insecticide	Household	2
Flygon Unlabelled Powder	Insecticide	Household	1
Gammaxene	Insecticide	Insecticide	1
Gammaxene Powder	Insecticide	Insecticide	3
Hexit	Insecticide	Household	1
Hit	Insecticide	Household	1
Laxman Rekha	Insecticide	Household	1
Licel	Insecticide	Household	1
Lindane	Insecticide	Insecticide	1
Loose Powder	Unknown	Unknown	1
Malathion	Insecticide	Insecticide	22
Metasystox	Insecticide	Insecticide	1
Methyl Parathion	Insecticide	Insecticide	2
Monocrotophos	Insecticide	Insecticide	83
Monocrotophos & Carbendazim	Insecticide	Combination	1
Monocrotophos + Ecaulex	Insecticide	Combination	1
Monocrotophos + Cypermethrin	Insecticide	Combination	1
Mortein	Insecticide	Household	1
Mortein Insect Repellent	Insecticide	Household	1
Mosquito Repellent	Insecticide	Household	1
Nicalm-10	Other	Unknown	1
Nuvacron	Insecticide	Insecticide	2
Organophosphorus	Insecticide	Unknown	7
Parad	Insecticide	Fungicide	1
Pesticide	Insecticide	Unknown	1

Product Name	Actual Use	Use Intended	No. of Cases
Phorate	Insecticide	Insecticide	16
Phorate & Chlorpyrifos	Insecticide	Combination	1
Phorate Tablets	Insecticide	Unknown	1
Phosphamidon	Insecticide	Insecticide	1
Pistoban	Herbicide	unknown	1
Pyrethine	Insecticide	Household	1
Pyrethroid Compound	Insecticide	Insecticide	1
Quinalphos	Insecticide	Insecticide	8
Quinalphos + Other Chemicals	Insecticide	Combination	1
Rat Poison	Rodenticide	Rodenticide	14
Roban	Insecticide	Household	1
Robon (Mosquito Killer)	Rodenticide	Household	1
Rodenticide	Rodenticide	Rodenticide	2
Rodenticide Powder	Rodenticide	Rodenticide	1
Roger	Insecticide	Insecticide	3
Rogofen	Insecticide	Insecticide	1
Termide	Insecticide	Unknown	1
Termide	Insecticide	Unknown	3
Thimet	Insecticide	Insecticide	2
Tik-20 (Fenitrothion)	Insecticide	Household	1
Tik-20 (Fenitrothion)	Insecticide	Household	5
Unknown	Insecticide	Unknown	1
Unknown	Rodenticide	Unknown	1
Unknown	Unknown	Unknown	4
Unknown	Herbicide	Unknown	3
Unknown	Insecticide	Unknown	403
Unknown	Other	Unknown	5
Unknown	Rodenticide	Unknown	39
Unknown	Tick control	Unknown	4
Unknown	Unknown	Unknown	173
Unknown Powder	Unknown	Unknown	1
Unlabelled Pesticide Powder	Insecticide	Unknown	2
Unlabelled Powder	Insecticide	Unknown	2
Unlabelled Powder	Unknown	Unknown	10
Unlabelled Rodenticide Powder	Rodenticide	Rodenticide	1
Zinc Phosphide	Rodenticide	Rodenticide	28
Total No. of Cases			1531

8.4. Registered Products involved in Poisoning

Product Name	Actual Use	No. of Cases
Acephate	Insecticide	2
Aldrin	Insecticide	4
All Out Mosquito Repellent	Other	1
Aluminium Phosphide	Fumigant	378
Anilofos	Insecticide	1
Arthrin	Insecticide	1
Baygon	Insecticide	93
Baygon Granules (Bait)	Insecticide	1
Baygon Powder	Insecticide	2
Baygon Spray	Insecticide	1
Butachlor	Insecticide	1
Butox (Deltamethrin)	Tick control	1
Carbaryl	Insecticide	1
Carbendazim	Fungicide	1
Carbofuran	Insecticide	1
Centrek (Chlorpyrifos)	Insecticide	1
Chlorophos	Insecticide	1
Chlorpyrifos	Insecticide	18
Chlorpyrifos + Cypermethrin	Insecticide	1
Copper Sulphate	Insecticide	4
Cypermethrin	Insecticide	20
Ddt	Insecticide	10
Deltamethrin	Insecticide	2
Dichlorovos	Insecticide	2
Diethyl Ether	Insecticide	1
Dimethoate	Insecticide	17
Edifenphos	Insecticide	1
Endosulfan	Insecticide	34
Endosulfan + Cypermethrin	Insecticide	1
Ethion	Insecticide	3
Ethylene Dibromide	Fumigant	2

Product Name	Actual Use	No. of Cases
Fenitrothion	Insecticide	1
Fenvalerate	Insecticide	5
Finit	Insecticide	2
Hexit	Insecticide	1
Hit	Insecticide	1
Laxman Rekha	Insecticide	1
Licel	Insecticide	1
Lindane	Insecticide	1
Malathion	Insecticide	22
Methyl Parathion	Insecticide	2
Monocrotophos	Insecticide	83
Mortein	Insecticide	1
Mortein Insect Repellent	Insecticide	1
Mosquito Repellent	Insecticide	1
Nuvacron	Insecticide	2
Phorate	Insecticide	16
Phorate Tablets	Insecticide	1
Phosphamidon	Insecticide	1
Pyrethine	Insecticide	1
Pyrethroid Compound	Insecticide	1
Quinalphos	Insecticide	8
Rat Poison	Rodenticide	5
Roban	Insecticide	1
Robon (Mosquito Killer)	Rodenticide	1
Roger	Insecticide	3
Rogofen	Insecticide	1
Thimet	Insecticide	2
Tik-20 (Fenitrothion)	Insecticide	5
Unknown	Rodenticide	7
Zinc Phosphide	Rodenticide	28
Total		813

8.4.1 Unregistered Products involved in Poisoning

Product Name	Actual Use	No. of Cases
2,4-D+Ddt	Herbicide	1
Anaconda 505 + Chlorpyriphos 50% + Cypermethrin 5% Ec	Insecticide	1
Astaf	Insecticide	2
Baygon & Rat Powder	Rodenticide	1
Baygon+Dimethoate	Insecticide	1
Bhc	Insecticide	1
Celphos + Alcohol	Insecticide	1
Chlorpyriphos + Mancozeb	Insecticide	2
Crogor	Unknown	1
Ddt/Aldrin	Insecticide	1
Dimethyl Phthoate	Insecticide	1
Doom (Ddvp) Furadon Granules	Insecticide	1
Endosulfan + Cypermethrin Etc.	Insecticide	1
Endrin	Insecticide	6
Endrin Tablets	Insecticide	13
Flygon Unlabelled Powder	Insecticide	1
Gammaxene	Insecticide	1
Gammaxene Powder	Insecticide	3
Loose Powder	Unknown	1
Monocrotophos & Carbendazim	Insecticide	1
Monocrotophos + Ecaulex	Insecticide	1
Monocrotophos + Cypermethrin	Insecticide	1
Nicalm-10	Other	1
Parad	Insecticide	1
Phorate & Chlorpyriphos	Insecticide	1
Quinalphos + Other Chemicals	Insecticide	1
Rat Poison	Rodenticide	9
Termide	Insecticide	4
Unlabelled Rodenticide Powder	Rodenticide	1
Total		61

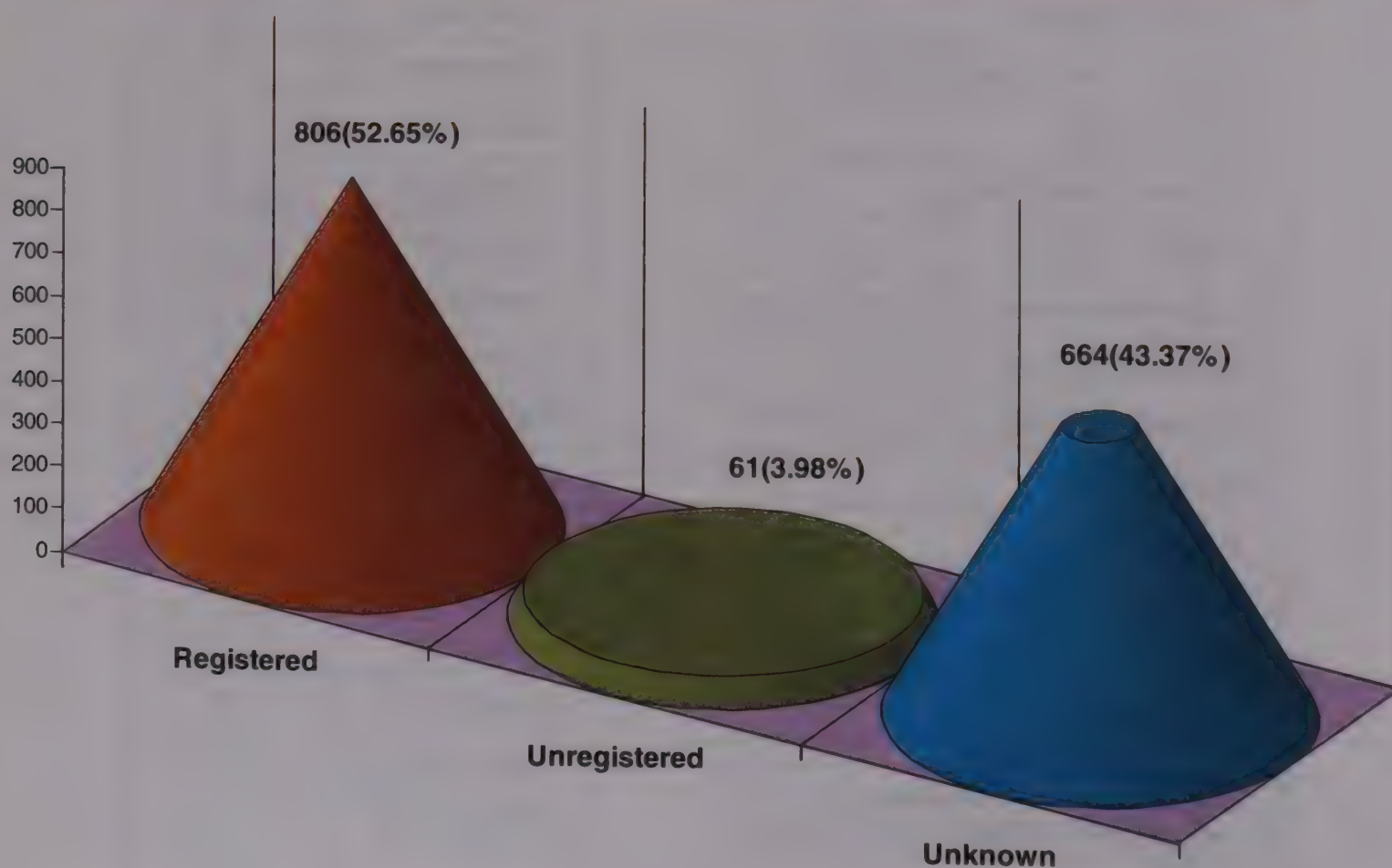
8.5. Number of Products Involved in Poisoning Cases (Registered/Unregistered/Product Name (Not Mentioned))

Product Type	No. of Products involved
Registered	61
Unregistered	29
Product Name (Not Mentioned)	23
Total	113

Number of Cases due to these Products

Product Type	No. of Cases
Registered	806
Unregistered	61
Product Name (Not Mentioned)	664
Total	1531

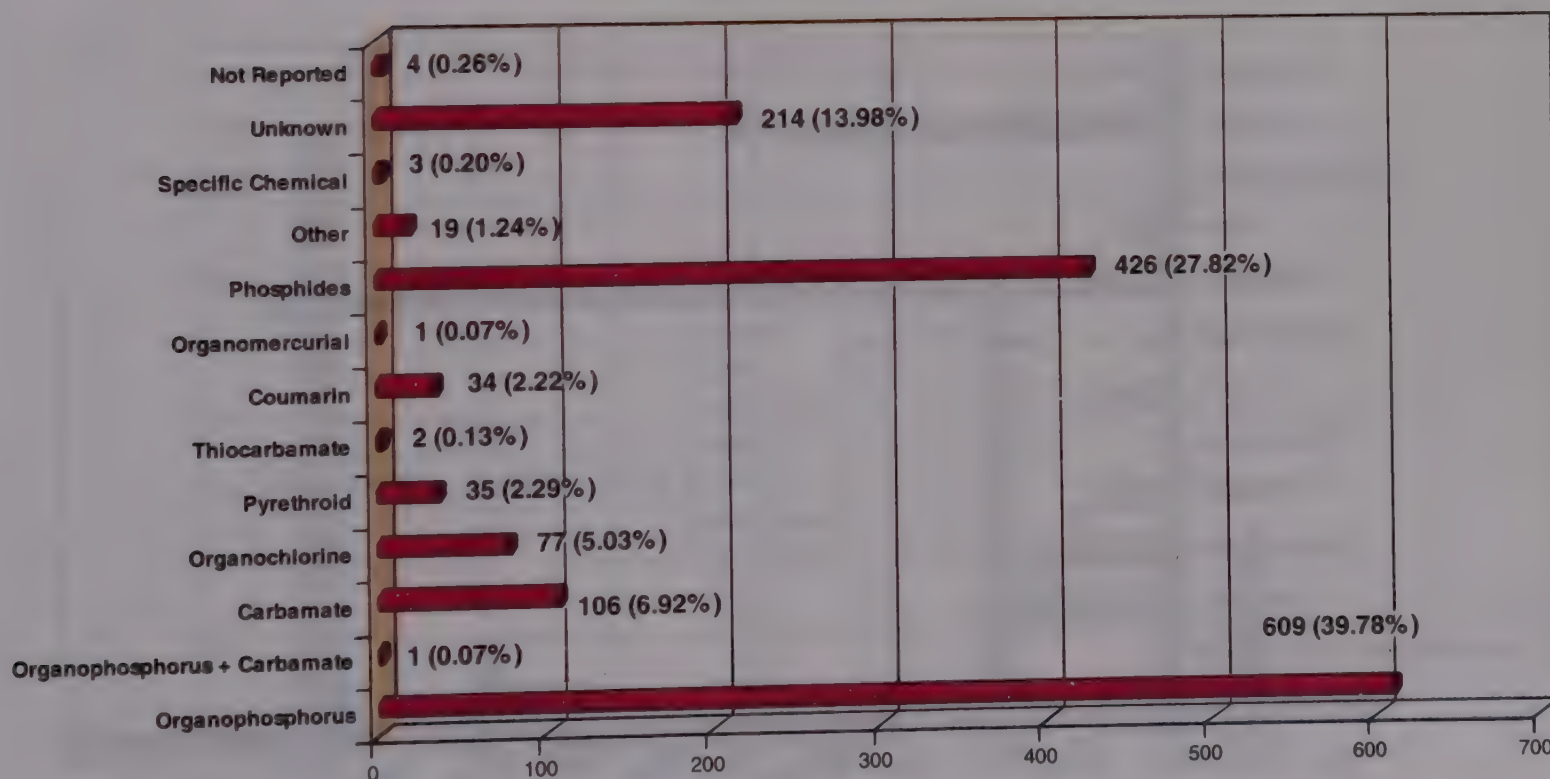
Cases of Posioning due to Registered/Unregistered/Unknown Products



9.0. Chemical Type of Product

Chemical Type of the Product	No. of Cases
Organophosphorus	609
Organophosphorus + Carbamate	1
Carbamate	106
Organochlorine	77
Pyrethroid	35
Thiocarbamate	2
Coumarin	34
Organomercurial	1
Phosphides	426
Other	19
Specific Chemical	3
Unknown	214
Not Reported	4
Total	1531

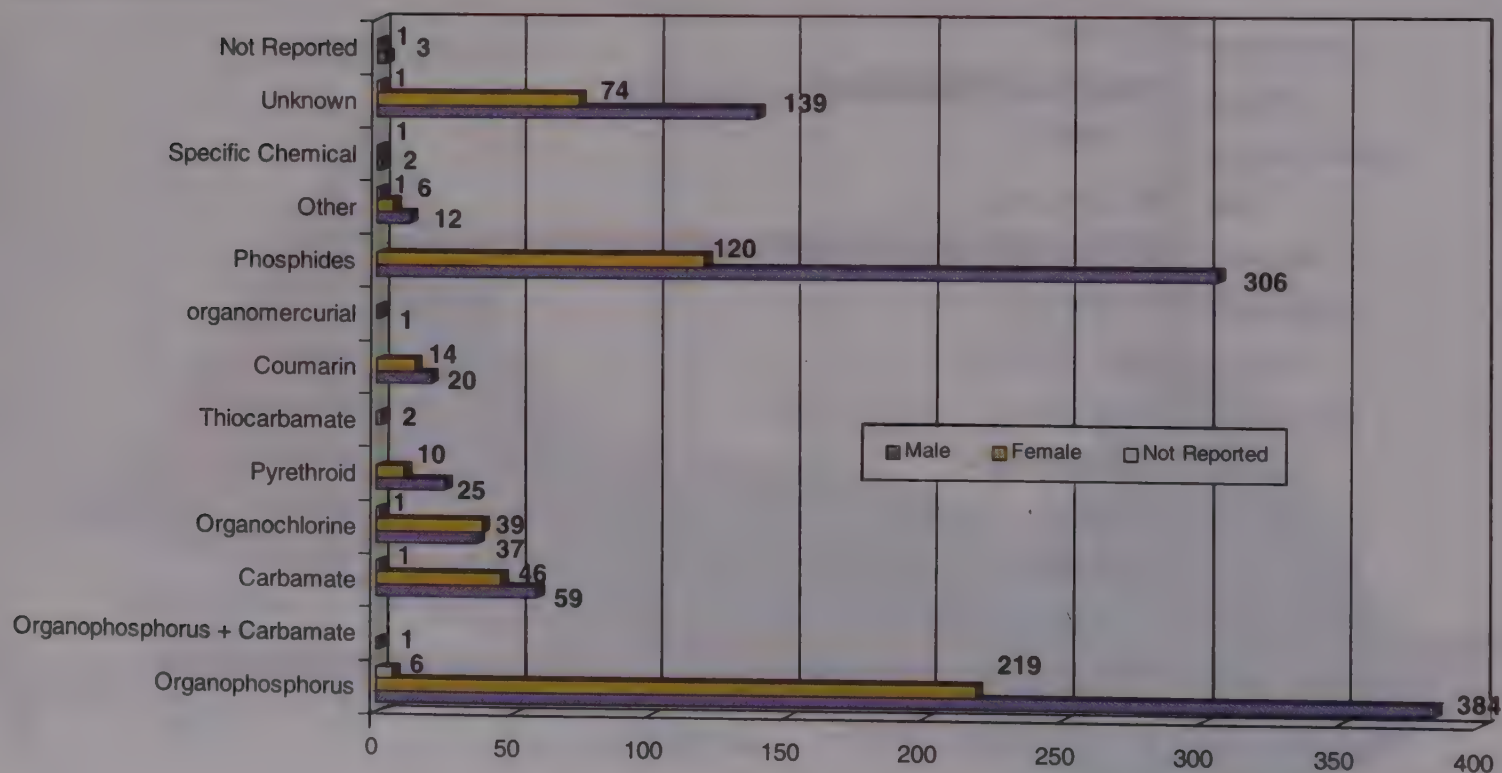
Chemical Type of Product



9.1. Chemical Type of the Product Vs Sex Distribution

Chemical Type	Male	Female	Not Reported	Total
Organophosphorus	384	219	6	609
Organophosphorus + Carbamate	1			1
Carbamate	59	46	1	106
Organochlorine	37	39	1	77
Pyrethroid	25	10		35
Thiocarbamate		2		2
Coumarin	20	14		34
Organomercurial		1		1
Phosphides	306	120		426
Other	12	6	1	19
Specific Chemical	2	1		3
Unknown	139	74	1	214
Not Reported	3	1		4
Total	988	533	10	1531

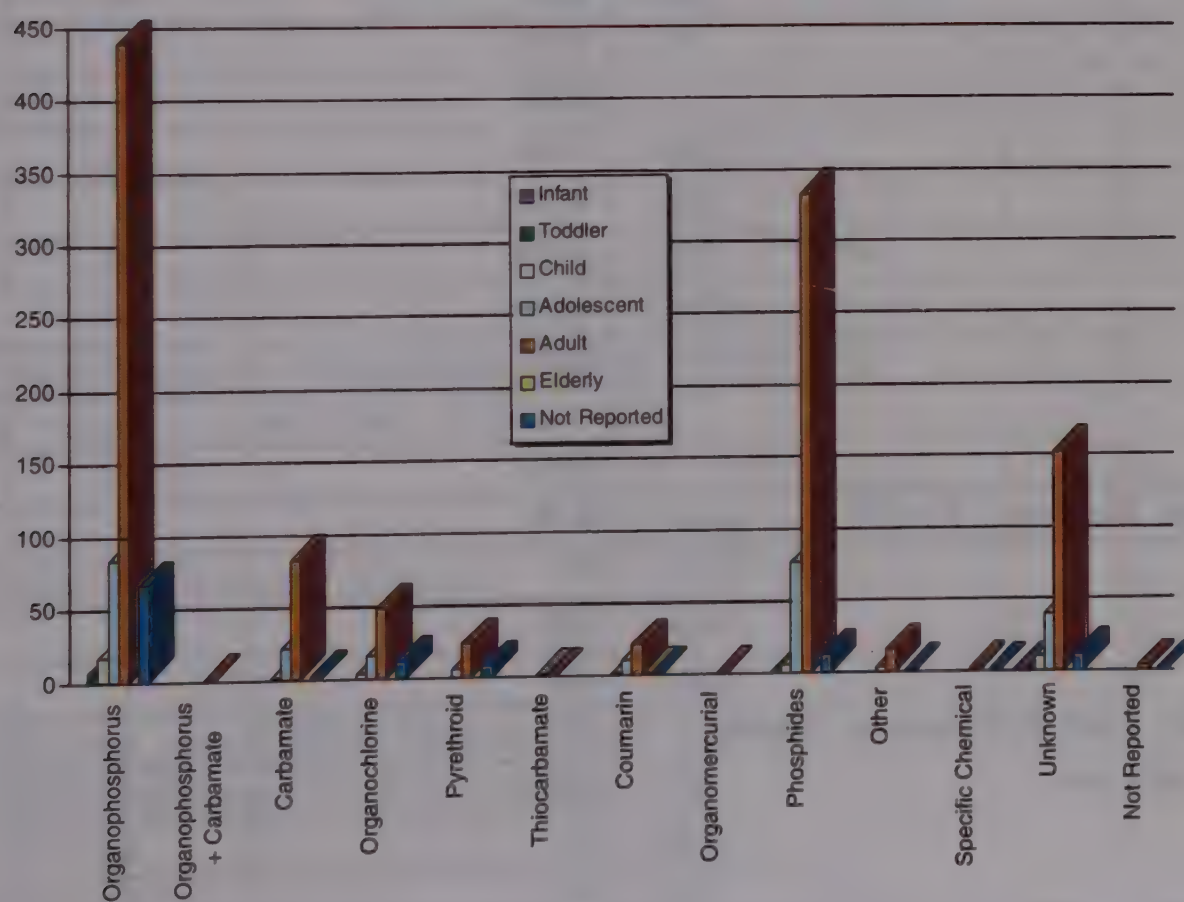
Chemical Type of Product Vs Sex Distribution



9.2. Chemical type of Product Vs Age Groups

Chemical Type	Infant	Toddler	Child	Adolescent	Adult	Elderly	Not Reported	Total
Organophosphorus		6	16	83	438		66	609
Organophosphorus + Carbamate					1			1
Carbamate			1	21	82		2	106
Organochlorine			3	15	48		11	77
Pyrethroid				5	23		7	35
Thiocarbamate				1	1			2
Coumarin			1	10	21	1	1	34
Organomercurial					1			1
Phosphides		1	5	76	332		12	426
Other				3	15		1	19
Specific Chemical					2		1	3
Unknown	1	1	10	39	152		11	214
Not Reported					3		1	4
Total	1	8	36	253	1119	1	113	1531

Chemical Type of Product Vs Age Groups



10. No. of Days in ICU & Hospital

Institution	Patient Name	Days in ICU	Days in Hospital
BTGH MRMC, Gulbarga, Karnataka	Santosh	1	1
	Kamalabai	3	6
	Viresh	1	1
	Raffiq	7	7
	Datta	4	4
	Roopa	3	3
	Ratnamma	6	0
Civil Hospital, Ahmedabad, Gujarat	AHC	13	20
	BJP	18	25
	KGT	2	5
	HNB	10	20
	MSP	15	20
	KBK	8	20
	KJP	8	25
	RJP	4	7
	PKK	1	4
	BKC	1	1
	APP	8	15
	DRJ	25	35
	RLK	5	7
	AJP	15	25
	VPP	3	10
	RBP	5	15
	DKB	15	25
	KMH	8	15
	KMS	10	15
	MBP	14	30
	BMT	15	18
Civil Hospital, Bhatinda, Punjab		5	5
	DKV	10	10
Escorts Heart Care & Research Centre, Faridabad, Haryana	S.R	2	2
	PT	2	2
	RB	1	3
	TC	1	3
	DP	1	1
	PS	5	8
	A	5	12
	KB	1	1

Institution	Patient Name	Days in ICU	Days in Hospital
Escorts Heart Care & Research Centre, Faridabad, Haryana	CP	1	1
	SK	1	1
	A	13	13
	JV	2	4
	KC	1	2
	BWD	1	3
	V	1	2
	RK	1	2
	SLY	5	5
	RS	2	3
	RK	2	3
	M	1	2
	AD	4	4
	Y	1	3
	R	1	2
	VG	9	12
	M	2	4
	S	3	4
	DK	2	5
	SG	2	4
	VP	2	5
	S	12	12
	AK	2	2
	B	7	7
		1	2
	MKS	5	7
	MG	1	1
	MS	13	21
	RCJ	1	2
Jeevraj Mehta Hospital, Ahmedabad, Gujarat	Kishore Bhai	10	10
Karnavati Hospital, Ahmedabad, Gujarat		10	15
		15	20
L.G. Hospital, Ahmedabad, Gujarat	KSM	9	0
	SBS	9	0
	ANP	10	15
	KBV	25	35
Lifeline Hospital, Ahmedabad, Gujarat	DYC	3	5
MGM Hospital, Warangal, Andhra Pradesh	DR	2	3
	MS	2	5
	BS	3	8

Institution	Patient Name	Days in ICU	Days in Hospital
MGM Hospital, Warangal, Andhra Pradesh	NR	3	9
	NP	1	1
	FK	2	7
	DN	1	5
	Md.Y.A	1	0
	MP	2	6
	MS	1	3
	PR	1	3
	TN	1	4
	SS	1	4
	KH	1	1
	GY	2	5
	LS	1	4
	SS	2	4
	KKS	1	1
	BK	3	8
	JL	1	1
	BL	1	1
	BS	1	3
	KS	1	2
	GS	3	6
	BN	2	3
	AV	1	4
	K.I.	1	3
	CS	1	1
	BS	1	2
	JJ	2	4
	AS	1	1
	PL	1	7
	BS	1	6
	BKR	2	6
	PR	2	4
	AD	2	2
	GL	1	4
	PV	1	4
	SN	3	5
	NR	2	2
	E.S.B	2	3
	B.A	3	6
	M.S	2	6

Institution	Patient Name	Days in ICU	Days in Hospital
MGM Hospital, Warangal, Andhra Pradesh	M.K	1	3
	AN	2	6
	V. Jogi Reddy	1	4
	BS	1	5
	KS	1	4
	KNL	2	4
	K.I	1	3
	VS	1	3
	NK	1	1
	CKR	1	1
	VR	2	4
	UR	1	1
	GV	1	3
	KM	1	1
	TS	2	2
	TLR	1	2
	AA	2	5
	NL	1	2
	PM	1	1
	BE	1	3
	ML	1	1
	YY	1	1
	PM	2	6
	YR	1	5
	N. Venkateshwarlu	1	1
	V. Sujatha	1	2
	K. Eliya	5	9
	C. Padma	3	5
	P. Vanajamma	1	4
	M. Sambaiah	1	1
	F	1	1
	P. Komuramma	1	3
	SM	2	5
	B. Kattaiah	2	2
	PM	4	9
	P. Rajaiah	1	3
	GG	3	7
	K. Laxmi	1	4
	SK	2	3
	P. Ramadevi	1	4

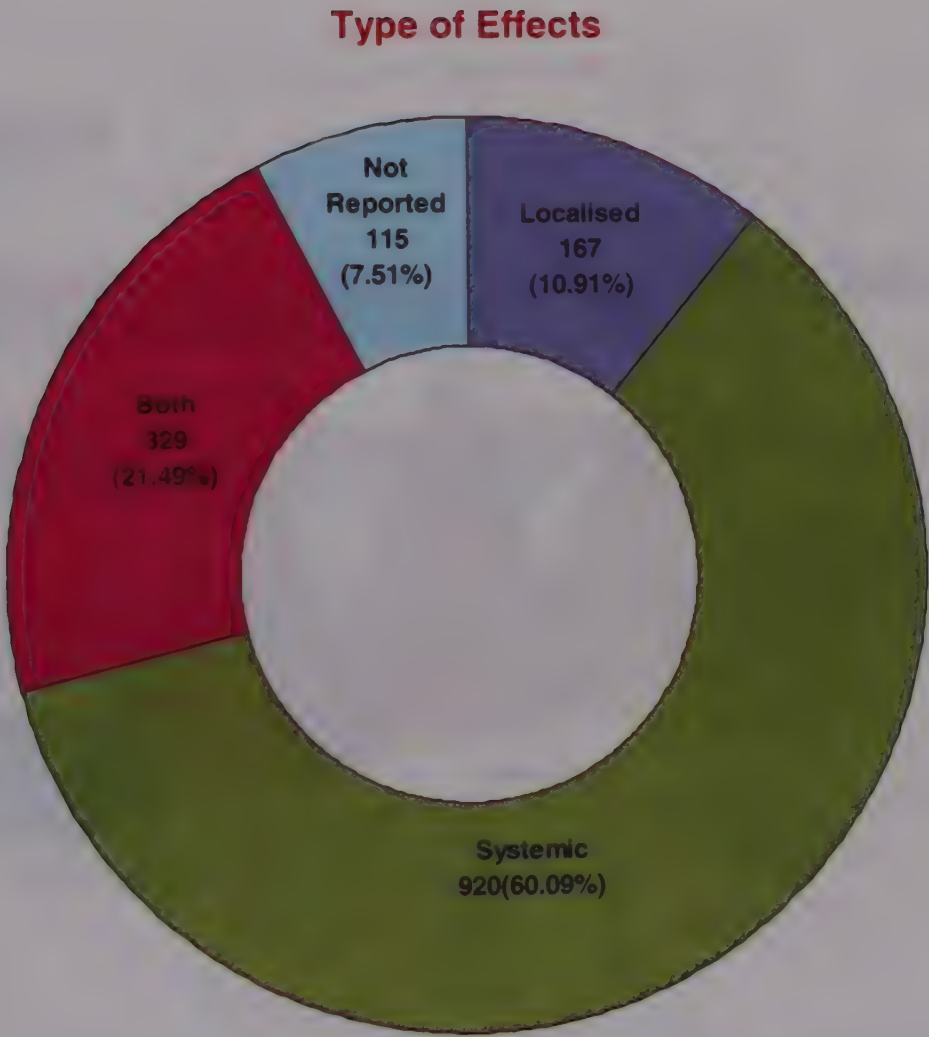
Institution	Patient Name	Days in ICU	Days in Hospital
MGM Hospital, Warangal, Andhra Pradesh	S. Jaipal	1	4
	BKM	1	1
	AS	1	1
	NK	1	1
	S. Sadanandam	1	5
	MK	1	1
	AR	1	1
	N. Kamala	1	3
	BS	3	5
	NY	1	1
	GS	3	4
	JR	1	1
	Kusa Rama	1	3
	NR	1	1
	AK	1	9
	KA	1	1
	KP	1	4
	AVS	1	1
	NS	1	4
	CS	3	9
	TSR	1	1
	T. Ramachander	2	0
	MN	2	7
	T.Somaiah	1	1
	SR	1	3
	Md.A	3	3
	PB	2	4
	SS	1	6
	ML	3	7
	LA	3	6
		2	13
	N. Aruna	1	4
	J. Shantha	1	4
	K. Lingaiah	1	4
	KL	1	1
	PRR	2	5
	AR	1	2
	KR	1	2
	J.S.Rao	1	4
	KL	1	1

Institution	Patient Name	Days in ICU	Days in Hospital
MGM Hospital, Warangal, Andhra Pradesh	K.Venkatesh	1	4
	N. Sadanandam	5	5
	A. Papaiah	1	4
	JR	3	3
	KR	1	1
	PS	2	3
	V	1	1
	PK	1	1
	M. Ragupathi	1	5
	Pastham Yadagiri	1	2
	AR	3	3
	JL	1	1
	BB	1	1
	G. Prameela	1	1
	DM	2	4
	Kadari Seshala	2	7
	SS	2	4
	J.Yashoda	1	4
	R	2	4
	LR	1	5
	ML	1	1
	MR	2	5
	BK	1	1
		1	1
	S.Sammaiah	2	2
	Bakkanna	1	3
	MK	3	4
	NC	1	1
	SC	1	1
	B.Balaji	1	1
	RR	1	1
	DK	1	1
	AS	3	5
	M. Narsamma	1	3
	JS	1	5
	B.Vanamma	2	3
	Bukya Tara	2	2
	SS	1	6
	J.Ravi	1	4
	K.Bikshapathi	1	2

Institution	Patient Name	Days in ICU	Days in Hospital
MGM Hospital, Warangal, Andhra Pradesh	Madduri Veeraiah	1	2
	Bukya Susheela	1	1
	B.Satyam	1	4
	MR	2	3
	MR	1	2
	G.Ramesh	1	3
	PK	1	4
	GV	2	4
	KM	1	3
	PN	2	8
PGIMS, Rohtak, Haryana	Anita	3	6
	Ramesh	15	15
	Pardeep	17	17
	Suman	1	0
	Vinod	8	10
	Mahinder	1	0
Rajasthan Hospital, Ahmedabad, Gujarat	SBA	15	15
	GCZ	2	2
Shardaben Hospital, Ahmedabad, Gujarat	BST	3	5
	RGR	1	4
	JDP	2	7
	PAS	2	4
	RRB	3	5
	HBS	3	5
Sushrusha, Ahmedabad, Gujarat	RSP	10	15
	HAP	2	5
V.S. Hospital, Ahmedabad, Gujarat	YCM	2	5
	BRB	7	16
	CBG	2	4
	KBT	3	7
	USP	14	20
	KDD	2	4
	KKP	15	25
	JNK	2	6
	DBS	1	4
	DMC	4	7
	JAP	2	5
	JAC	1	3
	HCP	2	8
	JKP	1	5

11. Type of Effects

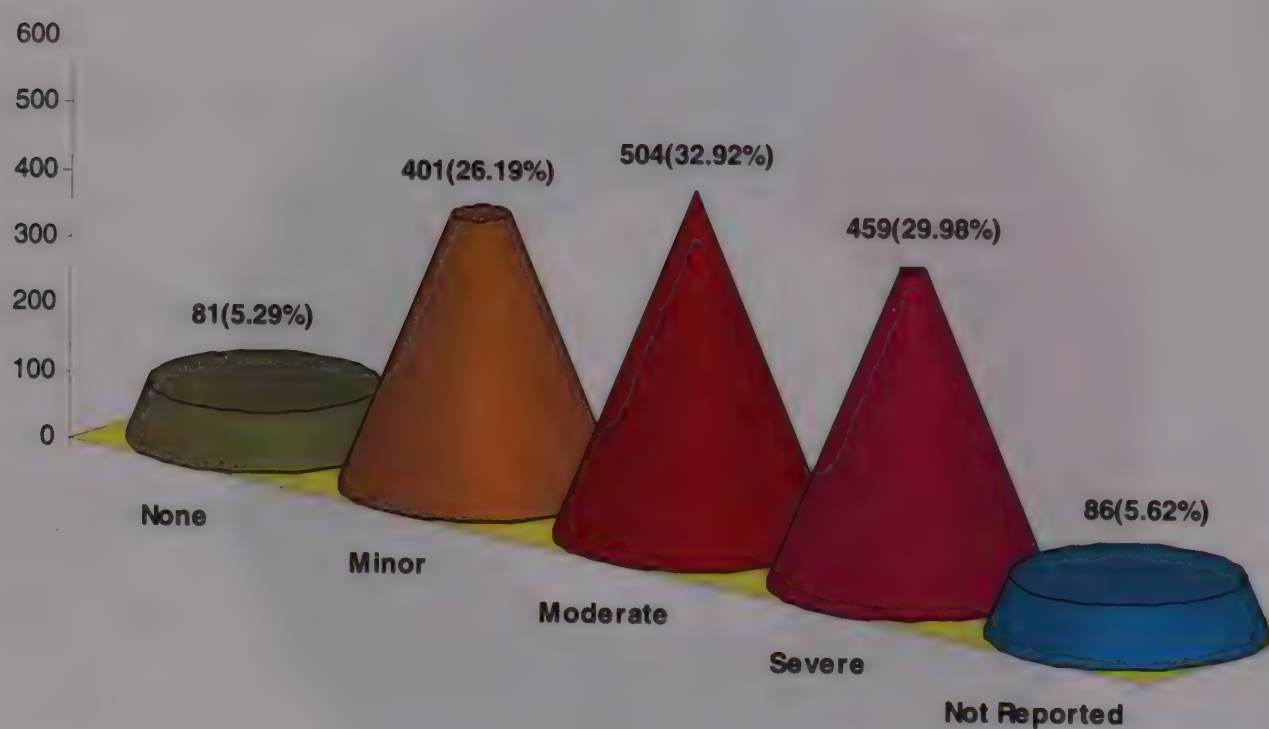
Effects	No. of Cases
Localised	167
Systemic	920
Both	329
Not Reported	115
Total	1531



11.1. Severity PSS (Poisoning Severity Score)

Severity PSS	No. of Cases
None	81
Minor	401
Moderate	504
Severe	459
Not Reported	86
Total	1531

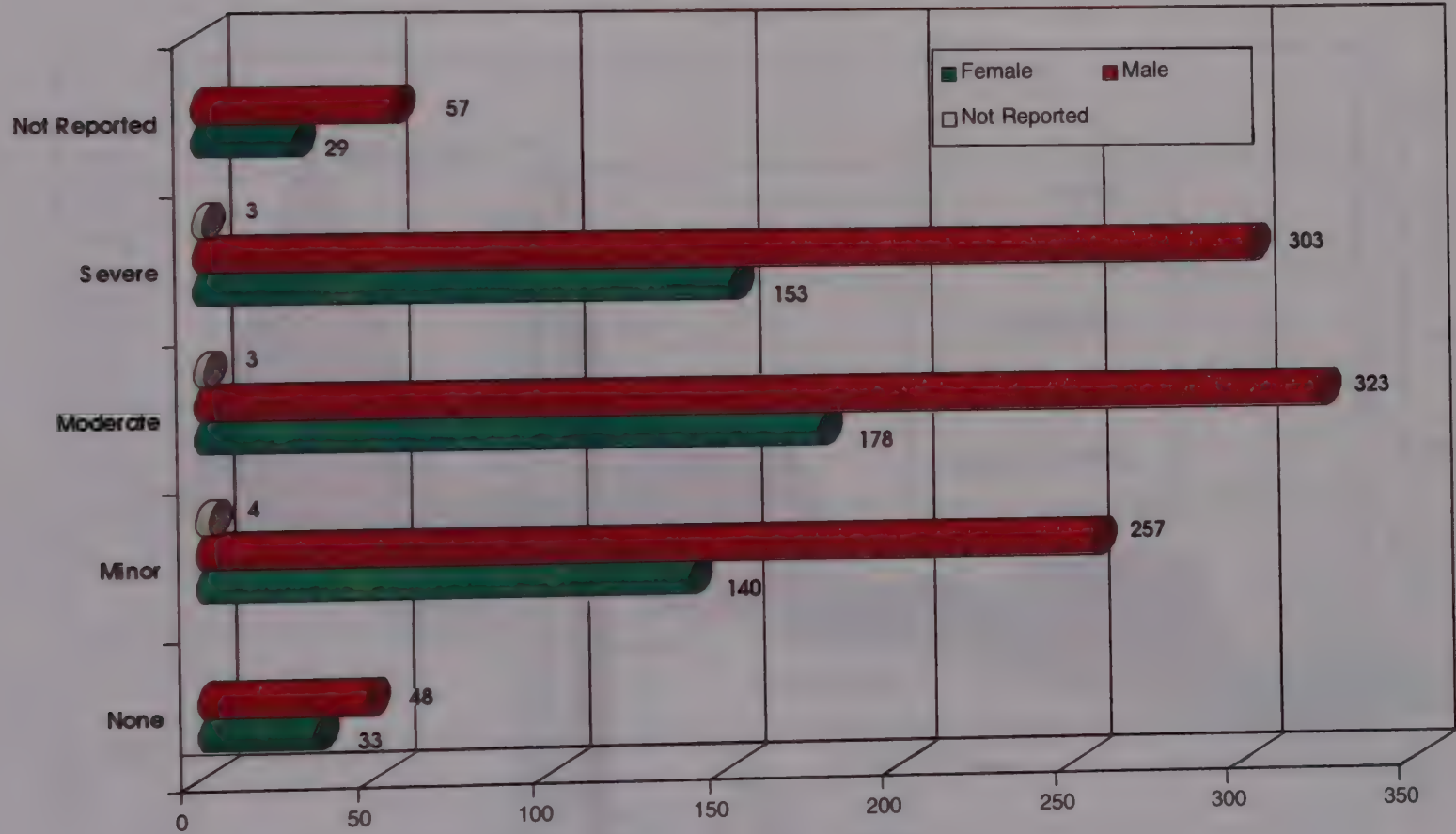
Severity (Poisoning Severity Score)



11.1.1. Severity PSS Vs Sex Distribution

Severity PSS	Female	Male	Not Reported	Total
None	33	48		81
Minor	140	257	4	401
Moderate	178	323	3	504
Severe	153	303	3	459
Not Reported	29	57		86
Total	533	988	10	1531

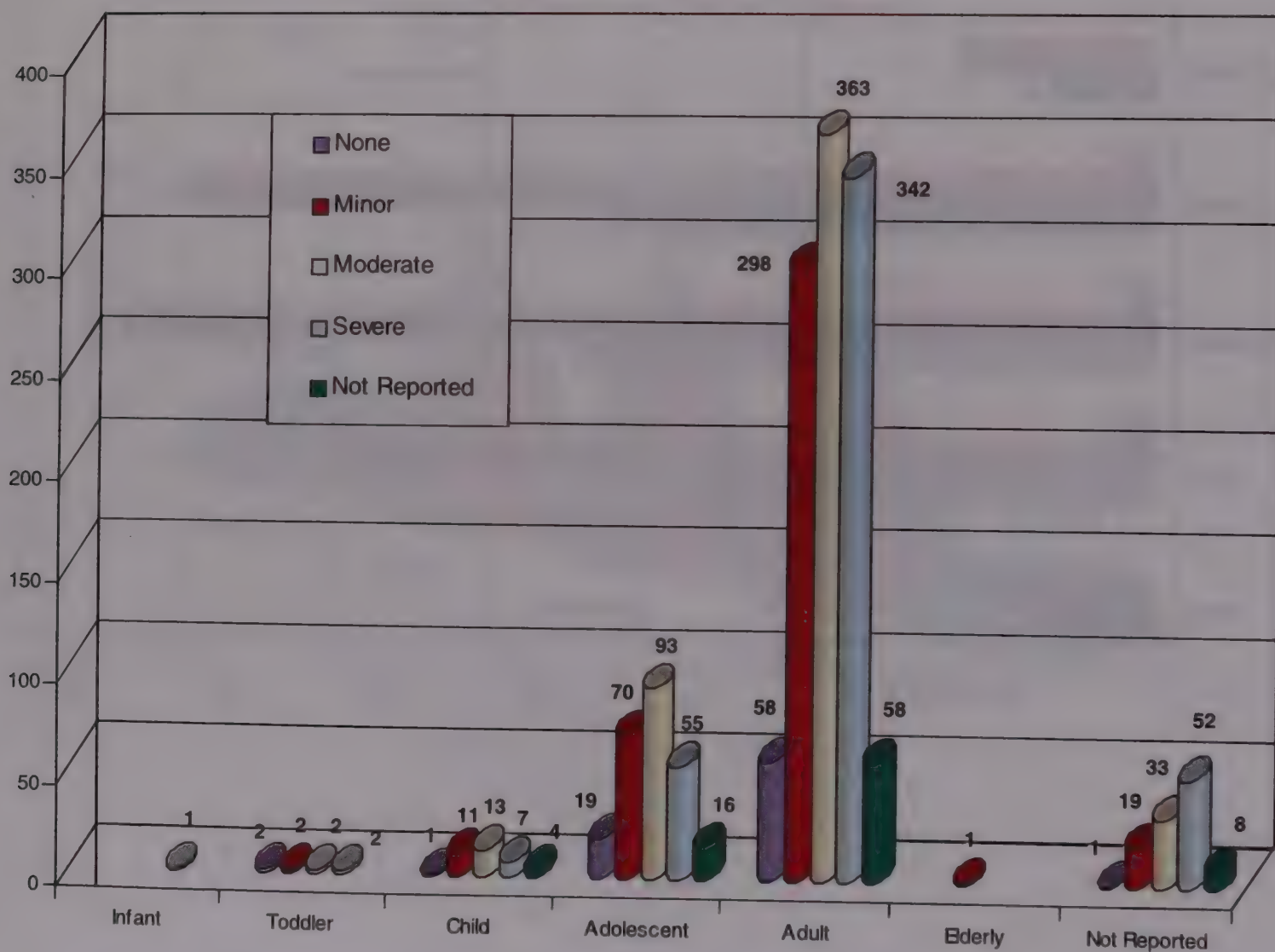
Severity PSS Vs Sex Distribution



11.1.2. Severity PSS Vs Age Groups

Severity PSS	Infant	Toddler	Child	Adolescent	Adult	Elderly	Not Reported	Total
None		2	1	19	58		1	81
Minor		2	11	70	298	1	19	401
Moderate		2	13	93	363		33	504
Severe	1	2	7	55	342		52	459
Not Reported			4	16	58		8	86
Total	1	8	36	253	1119	1	113	1531

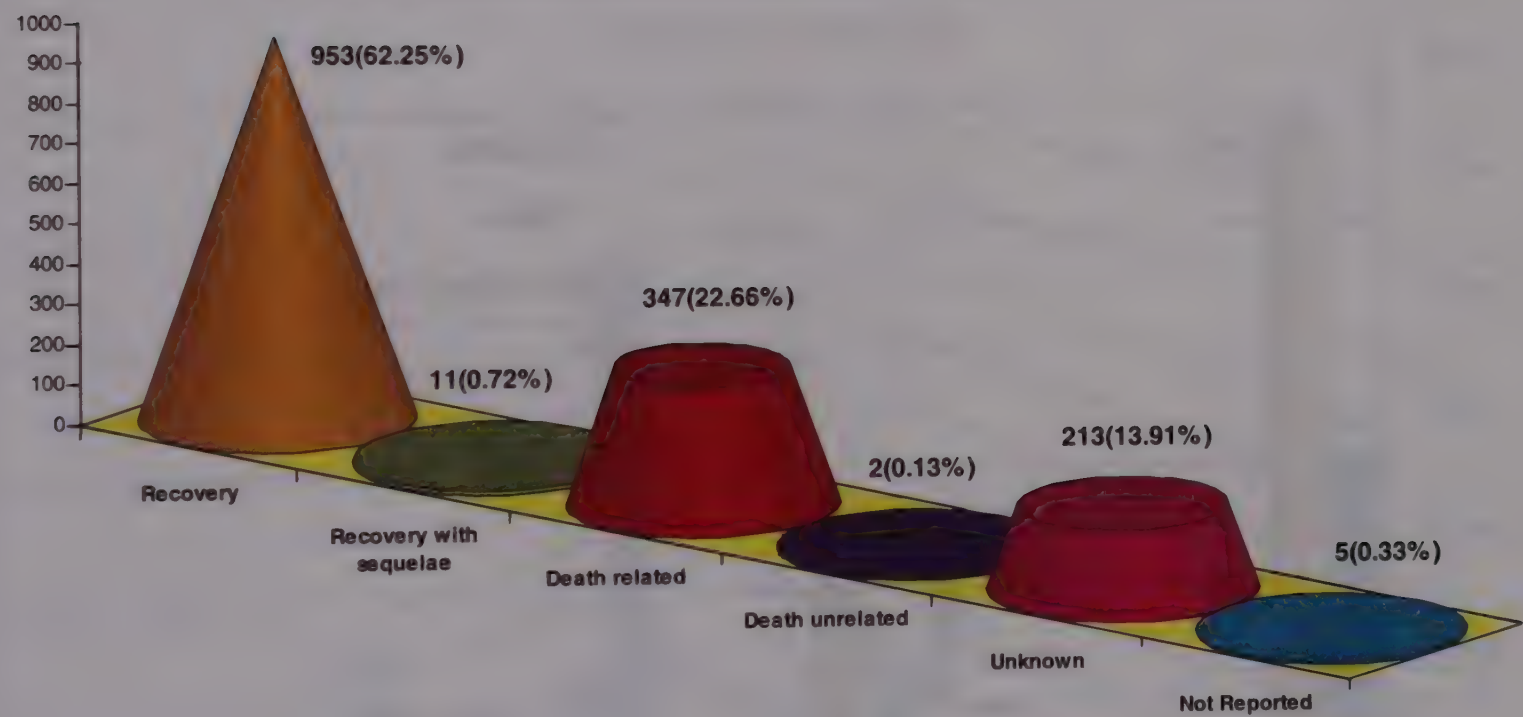
Severity PSS Vs Age Group



12.0. Outcome

Outcome	No. of Cases
Recovery	953
Recovery with Sequelae	11
Death Related	347
Death Unrelated	2
Unknown	213
Not Reported	5
Total	1531

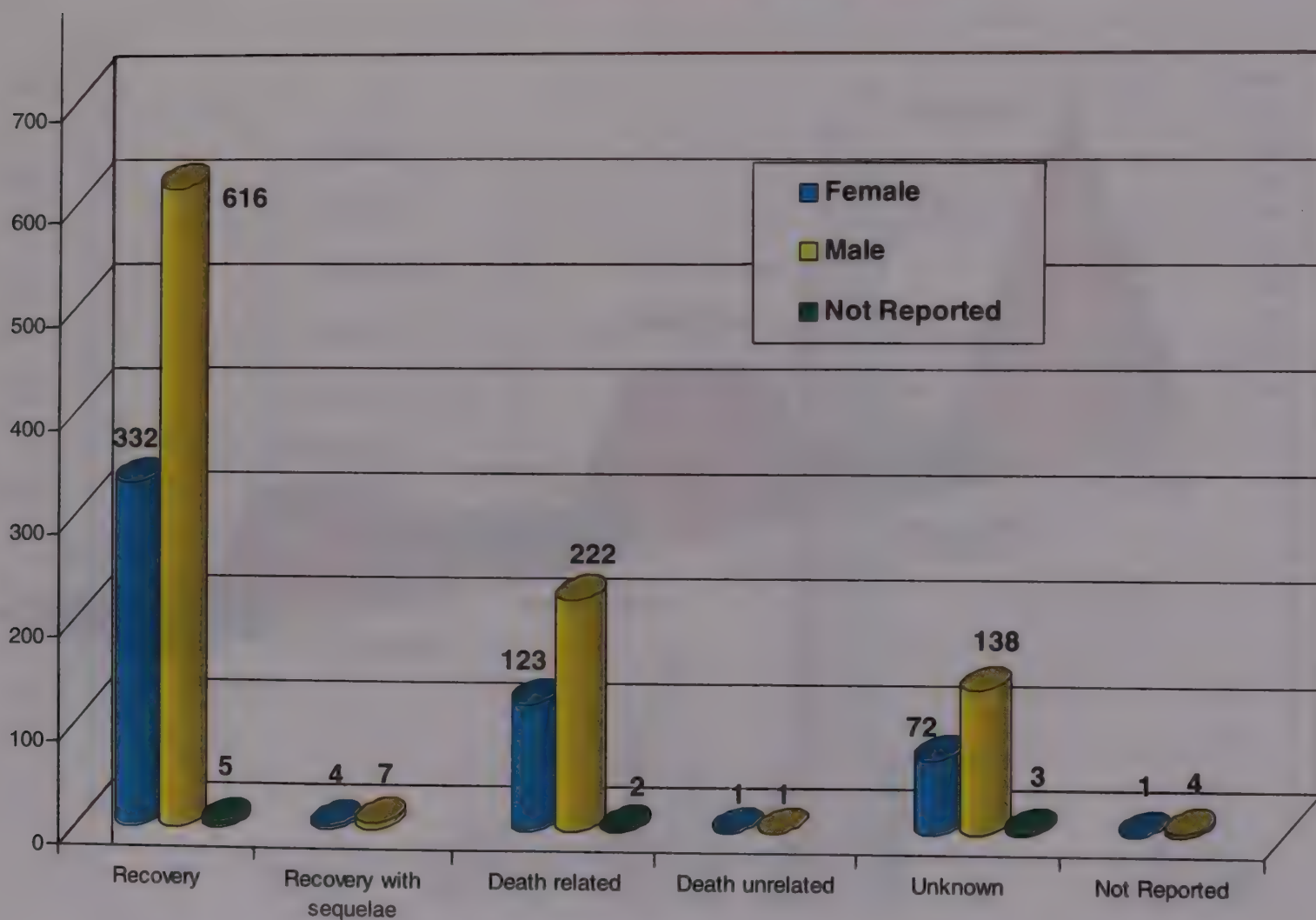
Outcome



12.1. Outcome Vs Sex Distribution

Outcome	Female	Male	Not Reported	Total
Recovery	332	616	5	953
Recovery with Sequelae	4	7		11
Death Related	123	222	2	347
Death Unrelated	1	1		2
Unknown	72	138	3	213
Not Reported	1	4		5
Total	533	988	10	1531

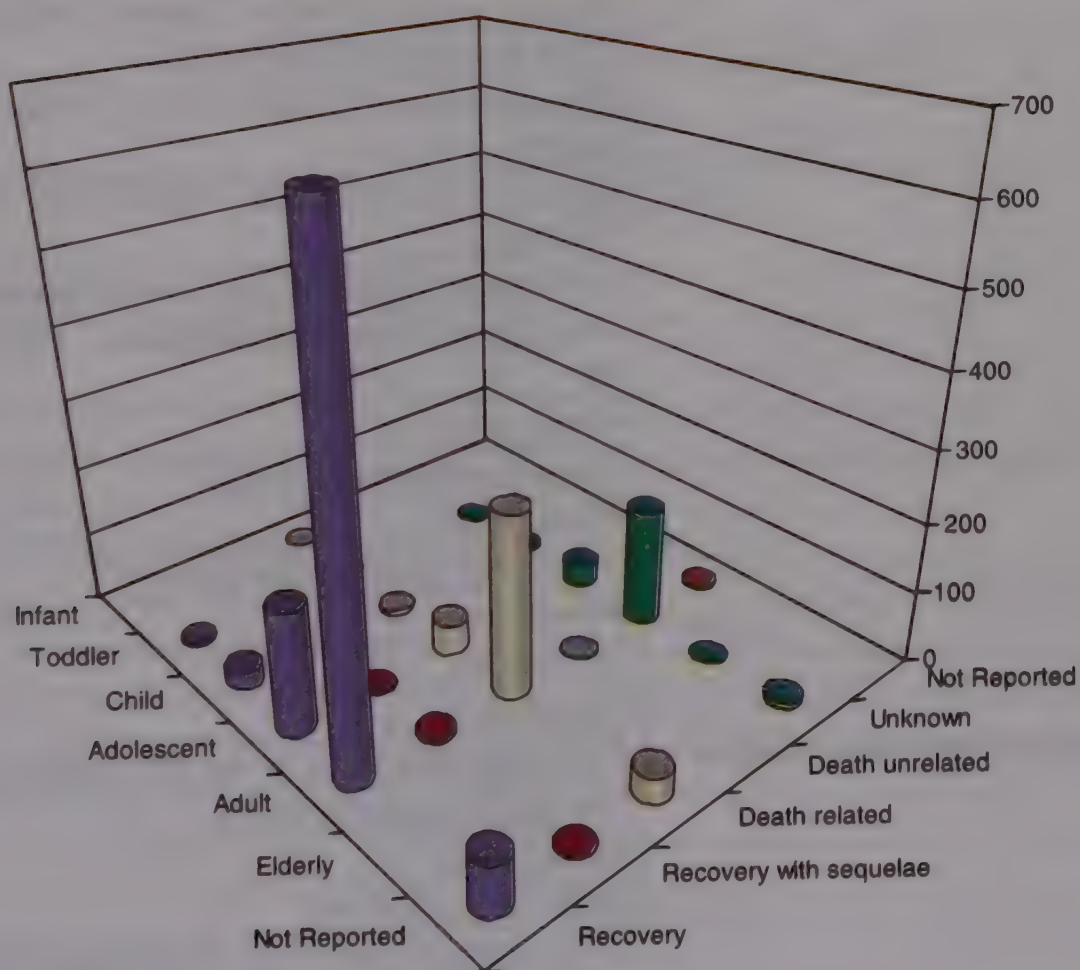
Outcome vs Sex Distribution



12.2. Outcome (Age Group)

Age Group	Recovery	Recovery	Death	Death	Unknown	Not	Total Reported
Infant			1				1
Toddler	4		2		2		8
Child	25		7		4		36
Adolescent	174	3	44		32		253
Adult	680	7	259	2	166	5	1119
Elderly					1		1
Not Reported	70	1	34		8		113
Total	953	11	347	2	213	5	1531

Outcome Vs Age Group



13. Comments

Institution	Comments
B.K. Hospital, Faridabad, Haryana	Patient informed that he took some tablet kept as preservative by mistake.
	Absconded.
	Transferred to Escorts Hospital & Research Centre
	Patient left the hospital himself.
	Referred to higher centre.
	Referred to Safdurjung Hospital, N.Delhi
	Referred to Safdurjung Hospital, N.Delhi
	Referred to Safdurjung Hospital, N.Delhi
BTGH/MRMC, Gulbarga, Karnataka	Shifted to higher centre.
	Referred to other hospital.
	Went against medical advise.
	Patient was discharged against medical advice.
	Patient is referred to higher centre for further treatment.
	Patient was discharged against medical advice.
	Patient is discharged against medical advice.
	Patient was discharged against medical advice.
	Went against medical advice
Civil Hospital, Ahmedabad, Gujarat	Patient was sent to higher centre for treatment of respiratory failure.
	Plasma ChE very low RBC ChE nil suspected OP poisoning
	Referred to higher hospital at Ludhiana.
	Very low plasma cholinesterase. RBC cholinesterase - Nil.
	Absconded.
	Low cholinesterase levels
	Absconded.
	Unlabelled Rodenticide powder
	Absconded.
	Absconded.
	Absconded.
	Poisoning was likely to be OP poisoning.
	Low cholinesterase levels.
	Absconded.
	Likely OP poisoning
	Likely to be OP RBC ChE - Nil; Plasma ChE - 85% inhibited.
	RBC Cholinesterase - Nil; Respiratory paralysis Patient on ventilator
	Likely to be OP RBC ChE - Nil; Plasma ChE-0 very low. Patient on ventilator.
	Likely to be OP poisoning. Plasma & RBC ChE - low.
	Likely to be OP RBC ChE - Nil; Plasma ChE-80% inhibition.

Institution	Comments
GGH MRMC, Gulbarga, Karnataka	Left against medical advice.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Shifted to higher centre.
	Absconded.
	Absconded.
	Referred to higher centre.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Went against medical advice.
	Went against medical advice/absconded.
	Absconded.
	Absconded.
	Went against medical advice.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
Government Hospital, Palwal	Shifted to Safdarjung Hospital, New Delhi.
Govt. Hospital, Ballabgarh	Referred to All India Institute of Medical Sciences, New Delhi for further treatment.
	Referred to higher centre for further management.
	Shifted to B.K.Hospital for further management.
Karnavati Hospital, Ahmedabad, Guj.	Also took 20% Fenvalerate (Fenkil)
L.G. Hospital	There was smell of pesticide and solvent from gas
	Very low cholinesterase levels + clinical picture
	During manufacture the chemical was in a sludge form
MGM Hospital, Warangal, A.P.	Absconded.
	Absconded.
	Absconded from the hospital.
	Patient left against medical advice.
	Absconded from Hospital.
	Absconded from the Hospital
	Absconded from the hospital.
	Absconded.
	Absconded from the hospital.

Institution	Comments
MGM Hospital, Warangal, A.P.	Absconded.
	Absconded from hospital.
	Patient absconded.
	Patient absconded,
	Absconded.
	Absconded.
	Absconded.
	Discharged after recovery.
	Absconded from the hospital
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Absconded.
	Alleged to have inhaled fumes of monocrotophos at his residence when suddenly opened the container.
PGIMS, Rohtak, Haryana	Absconded.
V.S.Hospital, Ahmedabad, Gujarat	Likely to be OP as RBC ChE - Nil & Plasma ChE - 80% inhibition.
	Likely to be OP - RBC ChE Nil; Plasma ChE-60% inhibition.
	Patient was working in a factory manufacturing unit.

13.1 Absconding

Case Division	No. of Cases
Other Cases	1446
Absconding	85
Total	1531

% of Absconding (Cases)

